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A FILTRABLE VIRUS AS THE CAUSE OF THE EARLY STAGE OF THE PRESENT EPIDEMIC OF INFLUENZA.

(A PRELIMINARY NOTE.)

BY

MAJOR H. GRAEME GIBSON, R.A.M.C.,
MAJOR F. B. BOWMAN, C.A.M.C.,
AND
CAPTAIN J. I. CONNOR, A.A.M.C.

(Interim Report to the Medical Research Committee.)

A PRELIMINARY note by MM. Charles Nicolle and Charles Lebailly on investigations suggesting the etiological part played by a filtrable virus in influenza cases was communicated recently to the Académie des Sciences.[1] A similar claim for the importance of a filtrable organism in the production of common colds had previously been put forward by Major George B. Foster, Junr., Medical Corps, United States Army, in the *Journal of Infectious Diseases* of November, 1917 (Vol. xxi, No. 5, pp. 451–474).

These observations have raised the important question as to whether the micro organisms hitherto regarded as of etiological importance in influenza and certain other catarrhal conditions of the respiratory tract play a primary or a secondary part.

The following investigations, undertaken at the request of the Adviser in Pathology, British Expeditionary Force, France, appear, so far as they go, to confirm and amplify the work of MM. Nicolle and Lebailly, and it is thought desirable to publish a preliminary report without delay. Further experiments are in progress, and a detailed report will follow in due course.

Nicolle and Lebailly, in their communication to the Academy of Science, reported that the unfiltered bronchial secretion of patients suffering from "La Grippe" collected during the pyrexial period was virulent to Chinese bonnet and *Macacus cynomologus* monkeys when injected by the subconjunctival and nasal routes. They also reported that the inoculation of the filtered bronchial secretion caused the disease in two men inoculated by the subcutaneous route. In view of the serious nature of the present epidemic the repetition of the experiments on man with the filtered sputum was not thought to be warranted, and our experiments with both filtered and unfiltered secretions were carried out on monkeys.

A supply of rhesus monkeys having been provided through the kindness of the Medical Research Committee, we determined, first, to attempt the infection of these animals by means of the filtered sputum, as had been done, in the case of man, by Nicolle and Lebailly.

For the first experiments two monkeys were used and two kept as "controls." The method of preparation of the sputum for filtration used by Nicolle and Lebailly was followed, but the filter candle used by us was a Chamberland L. 1 *bis*, in place of the Chamberland L. 2 used by them, and, owing to our inability to obtain a large exhaust pump at the moment, a Potain's aspirating pump was used to obtain a vacuum during the process of filtration.

The two candles used were carefully tested two days before the experiment with suspensions of *B. coli* and *Staphylococcus aureus*, and the filtrates found to be sterile.

EXPERIMENT 1.—*Inoculation of Filtered Sputum taken from a Case of Influenza on the Fifth Day of the Disease.*

Source of Infective Material.—Case F., suffering from uncomplicated influenza. No chest symptoms developed in this case, and the patient made an uninterrupted recovery. The temperature was 101.2° F. when the sputum was taken.

Infective Material.—Sputum was collected on November 9th, 1918, the fifth day of the patient's illness. Smears and cultures were made from the carefully washed sputum, and Gram-positive diplo-streptococci and Gram-negative diplococci were found to be present. Pfeiffer's bacillus was not observed either in smears or in cultures.

Method of Preparation of Inoculum.—The sputum was placed in a sterile bottle with ten times its volume of normal saline, and shaken with glass beads for five minutes. It was then centrifuged, at about 1,500 to 2,000 revolutions per minute, for a minute and a half. The supernatant fluid was passed through a Chamberland L.1 *bis* candle, the filtrate being collected in a sterile vessel. Cultures were made in serum glucose broth and on human blood agar plates, in the preparation of which the blood had been citrated and heated to 55° C. for ten minutes before mixing with the agar. This medium had given us excellent growths of all the organisms met with in the epidemic. These cultures were found to remain quite sterile in respect of non-filtrable organisms.

That afternoon (November 9th) 0.25 c.cm. of the filtrate was inoculated under the conjunctiva of the left eye of monkey No. 1, and 0.75 c.cm. was instilled up its nostrils.

Subsequent History of Case (Monkey No. 1).

On the evening of November 15th the monkey appeared to be somewhat off colour, and on the morning of November 16th it was distinctly ill, moping, and at times resting its head on its arms. It would not take its food, had some suffusion of the conjunctivae of both eyes, and its coat was "staring." On November 17th its coat was still "staring," but it was taking more interest in its surroundings and was eating its food again, and by November 18th, although its coat was still affected, it had apparently recovered.

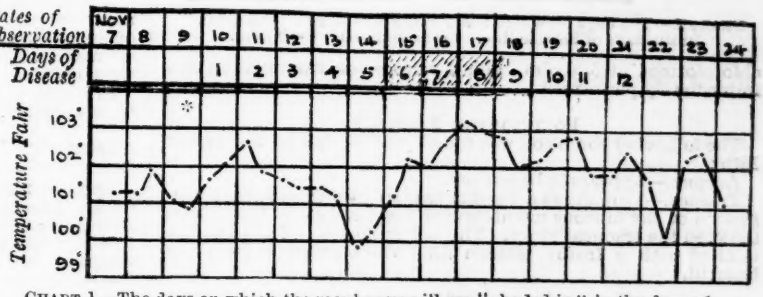

CHART 1.—The days on which the monkey was ill are "shaded in" in the days of disease line. * = Inoculated.

The temperature chart, with records from the second day before inoculation up to the end of the experiment, is set forth in Chart 1. It will be observed that the temperature of this animal had fluctuated considerably while under observation previous to inoculation, a fact which makes it impossible to say how much the illness was associated with a true pyrexia. The incubation period in this case corresponded to that observed by Nicolle and Lebailly in their monkeys inoculated with unfiltered sputum.

The blood of the monkey was taken on the fifth day of his illness to determine its power of agglutinating Pfeiffer's bacillus. No agglutination was observed in dilutions of 1 in 2, 1 in 10, 1 in 40, 1 in 80, 1 in 100. The monkey was allowed to recover, and is being kept with a view to determining the possibility of reinfection.

EXPERIMENT 2.—*Inoculation of Filtered Sputum taken from a Case of Influenza on the Third Day of the Disease.*

Source of Infective Material.—This experiment was carried out also on November 9th, 1918. Sputum was taken from a man (Case W.) who had been suffering from influenza for three days and who died on the eleventh day of his illness as the result of secondary infection of the respiratory tract leading to bronchopneumonia. His temperature on the day the sputum was taken was 103.6° F.

Infective Material—The examination of this sputum revealed the presence of pneumococci, a few Pfeiffer's bacilli, and many Gram-positive, non-haemolytic diplo-streptococci of a type which we have frequently observed in the bronchial secretions of men suffering from influenza in this area.

Method of Preparation of Inoculum.—The sputum was prepared for filtration in the same way as in Experiment 1. Before being filtered 0.5 c.cm. of the emulsion was inoculated subcutaneously into a white mouse. The mouse died eighteen hours later, and a pure culture of pneumococci (Type 1) was isolated from it. The sputum was filtered through a Chamberland L. 1 *bis* filter and the filtrate tested for sterility. The filtrate was then inoculated intraperitoneally into a mouse which showed no symptoms of any sort, and it also proved sterile for non-filtrable organisms on culture.

Subsequent History of Case (Monkey No. 2).

On the afternoon of November 9th monkey No. 2 was inoculated with 0.25 c.cm. under each conjunctiva, and 0.5 c.cm. was instilled up its nostrils. On November 16th—that is, on the seventh day after inoculation—the monkey appeared to be out of sorts, with slight diarrhoea. On the next morning it was very much worse, sitting with its head resting on its knees and moping. It was very depressed, off its food, and its coat was "staring." On the following morning it was much the same, and was apparently showing some loss of flesh and slight diarrhoea. It seemed to be slightly better in the afternoon, though still very depressed. Its temperature on this day was 103.2° F. The attack was more marked than in the first monkey.

The temperature chart is appended (Chart 2), but it is to be noted that the severity of the symptoms was much greater

than might be inferred from the pyrexia. That afternoon it was decided to kill the monkey in order to determine the exact condition of the respiratory tract at this stage. It was

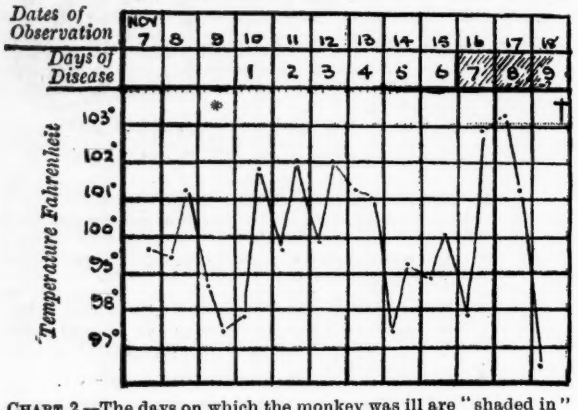

CHART 2.—The days on which the monkey was ill are "shaded in" in the days of disease line. * = Inoculated. † = Killed.

chloroformed at 3.30 p.m., and a *post-mortem* examination was immediately performed.

POST-MORTEM FINDINGS.

The following condition was found *post mortem* on November 18th:

Larynx.—Appears to be normal.

Trachea.—This shows a distinct reddening and apparent congestion of the mucous membrane of the trachea in the spaces between the tracheal rings. The lower portion of the trachea is filled with a frothy pinkish fluid which oozes up from the bronchi.

Lungs.

The pleurae are clear and glistening and apparently normal. The lungs are not collapsed.

Left Lung (external appearance):—*Upper Lobe.*—This lobe is salmon-pink in colour and air-containing. On the surface are a few deep red patches, the size of a pinhead; otherwise the lobe appears normal.

Middle Lobe.—The lower surface of this lobe shows a deep purple patch, triangular in shape, 2 cm. in size, across the base of the triangle. There is no evidence of pleurisy between the lobes.

Lower Lobe.—The upper margin is salmon-pink in colour. The lobe when placed on the table retains its shape and feels solid when compared with the upper lobe. On the posterior surface there is a large purple patch, extending from about 1 cm. from the upper margin of the lobe down to near the lower margin. It is about 3 cm. in width, and in the centre of this patch is another of a pinkish-yellow colour which projects from the surface of the lung, and is apparently a patch of emphysema.

Right Lung:—Upper and Middle Lobes.—These resemble the left upper lobe and are apparently normal except for the deep red points above described.

Lower Lobe.—The posterior surface shows a deep purplish patch similar to that seen in the left lower lobe, but not quite so large.

Lower Lobes on Section.—The lower lobes on section show the upper part pink and the lower part a deep purple. A viscid dark purple fluid, containing air-bubbles, drips from the cut surface of the lung.

Examination of the cut surface with a hand lens reveals no evidence of bronchopneumonia, and the lobe is so engorged that none of the smaller bronchi are visible to the naked eye in the purple area.

Abdominal Organs.

Liver.—This is of a deep purple colour and the surface shows a certain irregularly outlined mottling. A fine yellowish-grey mottling is also apparent when the liver is cut into. The cut surface bulges out from under the capsule. On scraping this surface a shiny gelatinous appearance is obtained. With a hand lens the small blood vessels are seen to be engorged and the lobules are outlined with irregular yellow lines.

Spleen.—This is somewhat engorged.

Kidneys.—There are no haemorrhages apparent on the surface of either kidney. The capsules strip easily, and on section the kidneys suggest the condition of cloudy swelling.

Microscopic Appearances.

Microscopical sections were cut of the lung, liver, and kidneys, and the following appearances were noted:

Lung.—Low power microscopic appearance shows an almost universal consolidation, the alveoli being filled with what appears to be an inflammatory and haemorrhagic exudate. In some areas the alveoli have escaped. The bronchi and larger vessels are filled with the above-described exudate. The mucous membrane of the bronchi is intact and some of the cells show a central mucoid accumulation. Leucocytic accumulation is scanty. There is nowhere any approach to grey hepatization. Large subpleural vessels are choked, but the pleura has escaped inflammatory change. Under the high power some capillary engorgement is to be seen and some leucocytic invasion of the plugged alveoli is present. The inflammatory exudate is seen to be made up of a fibrinous reticulum which is studded with the remnants of degenerate red blood corpuscles, some still retaining their original shape.

Liver.—Low power shows a normal amount of stroma and capsule. The bile ducts are intact. There is present some engorgement of the central lobular vein, spreading in some cases to the capillaries. High power shows central fat accumulation in a few of the hepatic cells in the central lobular zone. No leucocytic reaction is apparent. No marked grade of cloudy swelling.

Kidney.—Low power shows normal stroma and capsule. The larger vessels are somewhat engorged and the secreting tubules apparently normal. The capillaries in the glomeruli are dilated with red blood corpuscles. The tubules in some areas show some blurring of the cellular outline with some granularity. The smaller tubules are apparently normal.

BACTERIOLOGY.

No *B. influenzae* (Pfeiffer) nor the diplo-streptococcus commonly found in the human respiratory tract in cases of influenza were isolated.

On blood agar plate cultures from the frothy fluid present in the bronchi and trachea very few colonies of any description appeared in twenty-four hours.

A staphylococcus was isolated and also a very small Gram-negative bacillus showing more or less pleomorphism, which on subculture grew profusely as a white slime in blood agar and showed a very delicate growth in plain agar. No other organisms were isolated.

From the affected area in the lung blood agar plate cultures were negative.

EXPERIMENT 3.—*Inoculation of Unfiltered Sputum taken from a Case of Influenza on the Sixth Day of Illness.*

Sputum from a case of influenza which had been ill for six days and had already developed chest symptoms was taken on November 16th. The patient's temperature on this day was 103° F. His sputum at this time contained a haemolytic streptococcus and a Gram-positive diplo-streptococcus, mentioned as seen in the sputum used in Experiment 2. The sputum was prepared in exactly the same way as in the two previous experiments, except that it was *not filtered*.

Monkey No. 3 was inoculated the same evening with 0.25 c.cm. under the conjunctiva of the lower lid of its left eye, and 0.75 c.cm. were instilled up its nostrils. Emulsion of sputum used was given without being filtered. The monkey developed no symptoms of any sort, and remained well.

EXPERIMENT 4.—*Inoculation of Filtered Sputum taken from a Case of Influenza on the Sixth Day of Illness.*

The sputum used in Experiment 3 was then filtered in the same manner as that used in Experiments 1 and 2—that is, though a Chamberland L. 1 *bis* filter. The filtrate, as before, was found to be sterile in respect of non-filtrable organisms. This monkey also showed no symptoms and remained well.

SUMMARY.

1. Two rhesus monkeys, inoculated subconjunctivally and intranasally with the filtered sputum from cases of human influenza, became ill on the sixth and seventh day respectively—that is, after a period corresponding closely with that noted in human cases under similar conditions by MM. Nicolle and Lebailly.

2. Two control monkeys, kept in the same room under similar conditions, manifested no signs of illness during the same period.

3. Of the two inoculated monkeys, one rapidly regained normal health, all symptoms appearing to have subsided by the third day of the attack. The other seemed to be on the mend on the afternoon of the third day, when it was killed for further examination. In the animal the respiratory tract was found to show the presence of a haemorrhagic exudate affecting especially the lower lobes of both lungs. The condition found was in many respects comparable to that noted in certain human cases of influenza in which a fatal issue had supervened before the occurrence of marked secondary infection. In this connexion it is interesting to recall the tendency to haemorrhages which has so often been noted during the present influenza epidemic, and which is generally observed early in the disease.

4. Two rhesus monkeys, Nos. 3 and 4, at first used as controls and subsequently inoculated, the one with filtered, the other with unfiltered sputum, collected from a case of influenza on the sixth day of the disease, showed no symptoms and remained well.

5. Our observations, so far as they go, tend to confirm those of MM. C. Nicolle and C. Lebailly above quoted.

The *post-mortem* appearances are undoubtedly suggestive, and further work in this direction may throw considerable light on the question.

REFERENCE.

1 *C. R. Acad. Sci.*, p. 607; *Presse médicale*, October 17th, 1918; BRITISH MEDICAL JOURNAL, November 2nd, p. 495.

MEDICAL REPORTS ON SOLDIERS DISCHARGED FROM THE ARMY FOR THE CONDITIONS KNOWN AS "D.A.H." AND "V.D.H."

BY

THOMAS LEWIS, M.D., F.R.C.P., F.R.S.,

CONSULTING PHYSICIAN IN DISEASES OF THE HEART, EASTERN COMMAND; PHYSICIAN OF THE STAFF OF THE MEDICAL RESEARCH COMMITTEE; ASSISTANT PHYSICIAN AND LECTURER ON CARDIAC PATHOLOGY, UNIVERSITY COLLEGE HOSPITAL, LONDON.

(From the Sobraon Military Hospital, Colchester.)

THIS article forms a chapter of a small book intended in the near future for publication as an aid to officers of discharging and pensioning boards.* The rapid march of international events and the prospect of early demobilization renders the earlier publication of this chapter desirable. It has been submitted in its present form and fully discussed with the proper authorities, and their suggestions have been embodied in it. Its publication is in a form which expresses the matured views of the staff of the Sobraon Military Hospital, a hospital which deals exclusively with the "D.A.H." and "V.D.H." cases.

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The construction of answers in Army Form B 179A is one of the most responsible tasks which falls to the lot of the medical officer in charge of the case and of those who sit upon the discharging boards. Upon the correctness of the return depends the fair treatment of the discharged soldier and the expense involved by the State. Hasty returns entail endless trouble to the Pension Boards and seriously cripple the efficiency of their work; in the future they will entail serious hardships to individual men, and serious and unnecessary inroads upon the public purse. The State can afford to give and to give generously to the men who have served it, but the amount which can be given has a limit, and it is the duty of the medical profession to see that it is justly distributed; the system of distribution should be as uniform as possible.

I propose here to discuss some of the more important considerations which must be weighed by medical officers before they can efficiently fill up these forms, confining myself to the cases classed in the "heart" group. It will be convenient to do so under the headings of the separate questions formulated.

QUESTION 11. *Date of origin of disability.*

In giving the date of the origin of the trouble in "effort syndrome" cases,† the date at which the first symptoms were experienced should be entered. In half the cases this answer will be "in civil life" with or without an actual date. The date of origin should be ascertained during the patient's stay in hospital and not after his discharge has been announced. A long history, as the men well know, makes for boarding as unfit; but the same history decreases the awards of the Pension Board. A dilemma of this kind stimulates a truthful answer.

In mitral stenosis the onset of symptoms may be used, providing that the symptoms started in civil life. If the symptoms arose during the period of service the answer is more difficult to give. It may be taken that an early mitral stenosis is of at least three years' standing, that a fully-developed stenosis is of at least five years' standing. The condition develops very slowly. Stenosis fully developed in 1918 is a pre-war condition; early stenosis is not necessarily so.

If, therefore, there is no account of rheumatic fever or chorea in the civil history, then the benefit of the doubt should be given to the man in an early case, and the date should be entered for the war period; but if there is a rheumatic history dating shortly prior to enlistment, the mitral stenosis may be presumed to have originated at that time. The medical officer is on his safest ground when in early cases a history of rheumatic fever antedates the board by three or five years, and when in fully developed cases the rheumatic fever antedates the board by some five to ten years.

In aortic disease the estimate of date of origin, when the symptoms do not antedate enlistment, should be given as the date of rheumatic fever or syphilis* in the history. But if, as often happens, there is no such history of infection and the symptoms are of recent origin, then the decision should go in the man's favour, and a recent date should be entered (onset of symptoms). As opposed to mitral stenosis, aortic defects often develop quickly in rheumatic disease.

Similar considerations apply in the case of cardiac enlargement and of arterial disease and aneurysm, as in mitral stenosis and aortic disease, in judging the date of origin of the disability. Serious disturbances of rhythm should always be dated from the first onset of symptoms.

QUESTION 13. *Give concisely the essential facts of the history of the disability, etc.*

This question is usually answered with unfortunate brevity. In "heart" cases it should always contain (1) a note on the man's capacity for exercise, games, work in school-life or at any other relevant dates prior to enlistment. (2) A full statement with dates of relevant infections. (3) Date of enlistment. (4) Length and tolerance of training and its type. (5) Length and character of duty performed. (6) A brief history of symptoms, with a note on any event to which the symptoms are dated.

QUESTION 14.† *State whether the disabilities are* (a) *attributed to or* (b) *aggravated by:* (i) *Service during the present war;* (ii) *previous active service;*‡ (iii) *climate in pre-war service;* (iv) *ordinary military service before the war; or* (v) *serious negligence or misconduct on the man's part.*

The answers to the questions under (*a*) should conform to those to Question 11, already considered. If the origin of the condition dates from rheumatic fever, gassing, etc., it should be stated clearly. The only entry which can occur, except quite rarely, under (v) is a history or sign of venereal disease; such a history is relatively uncommon in military "heart" cases; and in syphilitic disease of the heart the disease is usually of long standing. Under (*b*) the answer is usually to be given in the affirmative, for almost all "effort syndrome" cases are aggravated by service (exceptions are most frequent amongst cases of the constitutional type in which service has been of short duration and the duties light), and most cases of real heart disease have also to be considered aggravated unless the term of service has been quite short.

QUESTION 14 (*a*). *If not due to any of these causes, to what specific condition do you attribute it?*

The answer should be: (1) "not applicable" where the disability is due to one of these causes; (2) "constitutional" where the disability has arisen gradually or from uncertain causes in civil life; or (3) name the infection or other event from which the symptoms or lesion are stated to have arisen.

QUESTION 15.§ *What is his present condition?*

The observed symptoms, the size of the heart, the presence of thrills or murmurs, the presence of a grave irregularity, should be noted, and in all instances a note should be made on the observed tolerance of exercise.

QUESTIONS 21–22 (*a*).

These are answered by the discharging board on the same lines as the answers given to Questions 15, 14, and 14 (*a*) by the medical officer.

QUESTION 23. *Is the disability in a final stationary condition?*‖ *If not,* (a) *How long is the present degree of disability likely to last?* (b) *If the present degree of disability is not likely to last twelve months, can a further assessment at a reduced rate be made? etc.*

The answer to the first part of this question in "heart" cases is almost always in the negative. Under (*a*) the answer, in all structural heart cases, is "permanent"; in the remaining cases the answer should be "six," "nine,"

* *The Soldier's Heart and the Effort Syndrome.* By Dr. T. Lewis. To be published at an early date by Messrs. Shaw and Sons, Fetter Lane, E.C.4.

† "Effort syndrome case" and "D.A.H." may be read as synonymous for pension purposes.

* A positive complement fixation test in an aortic case usually indicates old-standing disease of the aorta, usually of not less than five years' standing, if the aortic disease is judged to be syphilitic.

† Question 10 of Form Z22 is answered similarly.

‡ Military service abroad and before August, 1914.

§ Question 2 of Form A 36/C is answered similarly.

‖ Question 3 of Pension Form A 36/C and Question 11 of Form Z22 are similarly answered.

or "twelve months."* Under (*b*) the answer for "heart" cases should be in the negative. All "heart" cases in which the duration of the malady is considered temporary or uncertain should come up for re-examination.

DEGREE OF DISABLEMENT.

QUESTION 24 (*a*).† *What is the degree of disablement at which, in the Board's opinion, he should be assessed at present, independent of hospital or other treatment?* (Degrees of disablement should be expressed in the following percentages: 100, 80, 70, 60, 50, 40, 30, 20, less than 20, or *nil*.)

In answering this question there are two considerations. The first is an estimate of the man's actual physical capacity for work without distress.‡ The second consideration is the advisability of his engaging in such work; thus a man may have the strength to accomplish a task, but his condition may be such that the work endangers his health or his life.

"*Effort Syndrome*."

The physical capacity of such cases as are discharged permanently unfit from the army is reduced by an amount which may be computed from actual observations on the exercise tolerance of such patients, while in hospital, and from the amount and character of work of which they are capable on returning to civilian life. When any complete group of "effort syndrome" cases is considered, it is found that 50 per cent. are discharged as unfit within twelve months of their first admission to hospital. The exercise tolerance of the men in the group is very variable. On leaving hospital it is gauged as normal or reduced insufficiently to depress materially their value in the labour market in 20 per cent.; it is reduced to the extent that there is appreciable difficulty in taking five-mile route marches and in doing stiff thirty-minute exercises in the next 30 per cent.; it is so reduced as to render the men incapable of such marches and exercises in the next 30 per cent.; it is reduced so that anything but very light physical work is precluded and so that there is discomfort in walking one to two miles daily in the last 20 per cent. in the average; from the observations we may gauge the disability of the groups discharged as permanently unfit (namely, the last 30 per cent. and 20 per cent. of the whole) as not far short of 40 and 60 per cent. respectively.

The capacity for work as judged by return to occupations forms a serviceable check to the observed tolerance in hospital. In a group of 97 men discharged unfit as "D.A.H." cases only 8 were unoccupied less than nine months later, and this by reason of ill health. The average working hours of the group, according to the men's own statements, was forty hours per week, or almost six 7-hour days. Now it is true that in this period of nine months there had been improvement in the health of some of these men, as seen in the accompanying table; but according to their own statements it had been only slight, such improvement as occurred being largely attributable to return to the home life and to the removal of the threat of duty overseas. Despite these relatively good hours, however, the capacity for work was clearly reduced. The 7-hour day is not to be compared to the 8-hour day of the heavy trades. The men worked for the most part in light or sedentary occupations, and there had been a good deal of movement towards lighter work amongst them. The character of the work before and after serving is shown in the accompanying table.

Men originally in heavy employments pass in the main into lighter employments; so do those originally on moderately heavy work, though to a lesser extent. Amongst the men originally employed on light or sedentary work the capacity for work is but little changed by their term of army service. The hours of work are of chief importance in showing that the amount of work given by them to the service, before they leave it, is to an extent an unreliable index of their capacity. A man from whom the army can obtain only an hour's work, will work seven the moment he is subject to the wage-earning stimulus.

Numbers of Men engaged in Work of Different Grades.

Work Before Serving.		Work After Serving.	
Heavy	27	Heavy	7
		Moderate...	8
		Light or sedentary	10
		None	2
Moderate	27	Heavy	1
		Moderate...	12
		Light or sedentary	13
		None	1
Light or sedentary	43	Moderate...	1
		Light or sedentary	38
		None	4
Total	97	Total	97

The disability is to be judged in "effort syndrome" cases on physical capacity alone. The employments which the men take up do them no injury; on the contrary they are beneficial, as evidenced by the improvement, slight though it be, in the group as a whole. Inquiries have clearly elicited the fact that there is improvement. The actual replies received from 104 (out of 109) men questioned within nine months of discharge may be tabulated:

Symptom Change after Discharge.

Very much improved	4
Much improved	8
Slightly improved	30
Unchanged	56
Slightly worse	4
Decidedly worse	2

We have seen very remarkable improvement in isolated instances, in men coming to report themselves, but in the group as a whole it is no more than slight.

The disability of "effort syndrome" cases with fair exercise tolerance may be fairly placed at 20 per cent. or less, and in those with poor exercise tolerance at 30 to 40 per cent. Exceptionally it may be placed as high as 50 or 60 per cent. in cases where development is poor or where a history of rheumatic fever is given. The group showing poor exercise tolerance is the only group which should, but is not the only group which will, come before invaliding and pension boards to any extent until demobilization begins.

In the average, the assessment of the disability at the first re-examination of the pensioners should fall away by some 10 or 20 per cent., if this re-examination falls at the end of nine months, for during the first nine months health will improve.

Mitral Stenosis.

In early and uncomplicated cases of mitral stenosis (by which I mean stenosis of such degree that the characteristic murmur is present on occasion only, or only on lying down or after exercise) the exercise tolerance is often quite normal; many men with this valvular defect have spent months on front line work, have been in heavy fighting, and have been little the worse for it. In early cases there is usually no reduction of physical capacity for work, but all such cases run risk when engaged in heavy work, and it is not advisable that they should be so engaged, despite good exercise tolerance. A developed mitral stenosis, even if the exercise tolerance is good, is a serious defect; the prospect of life is considerably reduced. Such a lesion may be taken to indicate that the heart as a whole has been invaded. That is, indeed, the chief prognostic significance of mitral stenosis generally; the heart muscle is rarely sound. Where there is a developed stenosis, as indicated by a diastolic murmur or thrill constant in all postures, or where early stenosis is combined with poor exercise tolerance, the disability should be assessed highly (the detailed assessments are given in tabular form). The other chief factors of significance in gauging the extent of disability are: Enlargement of the heart, venous engorgement, and untreated fibrillation of the auricles. The presence of either of these three complications should place the assessment very high. If two or more are found in combination the disability is almost total. Fibrillation of the auricles is often the immediate precursor of heart failure in these patients; the failure may be warded off for some while by treatment and the disability temporarily reduced. As a general rule, a mitral stenosis case which shows

* Whenever possible, one of the longer periods should be entered; in entering a longer period in an "effort syndrome" case, the total disability may be reduced by 10 per cent. in the average for anticipated improvement.

† Question 4 of Pension Form A 36/C and Question 12*a* of Form Z22 are to be answered on similar lines.

‡ The basis of the estimate is to be the man's physical capacity as compared with that of the ordinary healthy man of the same age. It does not vary simply with his earning capacity, however, since pension is not merely a recompense for impaired p wer of earning a livelihood, but is also a compensation for loss of the amenities of life.

enlargement of the heart and venous engorgement is in a worse way than is a similar case in which untreated fibrillation is added. For in the last case the muscle of the heart is sounder, bearing as it does a greater burden, yet showing the same embarrassment.

Aortic Disease.

Much the same considerations apply in aortic disease as in mitral stenosis. But aortic disease is to be regarded as the more serious lesion, and I assess it 10 per cent. higher throughout. It is not to be forgotten that the base of the aorta and the coronary arteries are frequently involved. In some patients with aortic disease exercise tolerance is perfect; many soldiers have fought in the front line with this lesion, and without mishap; some cases of aortic disease live to a good old age. But these are cases in which the lesion, as judged by the state of the pulse, is slight, and in which there is no material cardiac enlargement or other complicating factor. The presence of a poor exercise tolerance is, as a rule, a clear indication of the seriousness of the lesion; the presence of much cardiac enlargement, of serious engorgement, or of angina pectoris is ominous. In assessing aortic disease in the accompanying table I divide it into "slight" or "developed." By slight aortic disease I mean such disease as is evidenced by an early diastolic murmur at the base without there being any material alteration of the pulse. By developed aortic disease I mean full regurgitation with a collapsing pulse, or aortic regurgitation with stenosis.

Enlargement of the Heart.

Many soldiers discharged the army exhibit cardiac enlargement in the absence of a valve lesion or other obvious cause to account for it. Where such enlargement is more than slight (slight hypertrophy such as is indicated by a maximal impulse 4½ in. from the nipple line or *definitely beyond* the nipple in the fifth or sixth spaces) or when it is associated with poor exercise tolerance, the condition forms a serious disability. If untreated fibrillation is present, if a venous engorgement is added, then the disability is very similar to that found in similar cases in which mitral stenosis is also present; I mean to say that the addition of mitral stenosis to such a picture does not materially increase the disability.*

Arterial Disease.

Thickening of the peripheral arteries is often local, and when local does not impair the capacity for work; a given grade is of less significance as age advances. The chief symptoms of arterial disease, the chief disabilities to which it gives rise, are due to impaired nutrition of important organs such as the heart, brain, or kidneys. In an arterio-sclerotic man, therefore, in addition to the exercise tolerance, the signs of an enlarged heart, of high blood pressure, or renal involvement, are those which chiefly gauge the degree of disablement. Signs of cardiac failure, with or without fibrillation of the auricle, may be present; in such the condition is usually terminal.

Aortic aneurysm or *grave angina pectoris* naturally involves very high grades of disability.

Fibrillation of the auricles has been known to last for as long as thirty years, but in its presence the duration of life is rarely more than ten years. It is rarely uncomplicated. Standing by itself it should be the ground of assessing the disability highly. It is recognized by the presence of gross pulse irregularity which does not disappear when the heart rate is raised to 140 or over by any means. The actual capacity for work may be greatly increased by appropriate treatment.

Auricular flutter is very rare in soldiers. It is only to be diagnosed with certainty by special forms of examination. It is to be suspected when pulse rates of 140 to 160 are exactly maintained under varying conditions of posture and exercise. Persistent flutter and fibrillation may both be taken to signify myocardial involvement. In assessing disability they may be treated alike.

Paroxysmal Tachycardia.—When the attacks are mild and infrequent and the condition is uncomplicated (the usual picture), the disability is slight. More severe attacks debar the patients from heavy work, even though the attacks are infrequent, for such work will often provoke further attacks. Severe and frequent attacks prohibit heavy and moderately heavy work. In gauging these disabilities I treat the condition as uncomplicated by obvious cardiac lesions. If so complicated, paroxysmal tachycardia may be assessed on the same lines as fibrillation.

Mitral Regurgitation.—This condition has been deliberately omitted from the table of disabilities. The diagnosis of regurgitation is uncertain; its cause when diagnosed is not easy to ascertain. In itself it does not lower exercise tolerance or in any way disable. The assessment of the disability, when regurgitation is thought to be present, should be based exclusively on associated factors, such as exercise tolerance, enlargement of the heart, a history of rheumatic fever recent or repeated, fibrillation, aortic disease, etc. Where exercise tolerance is normal and there is no history of rheumatic fever, no assessment is required. In cases which give a history of rheumatic fever and show a good exercise tolerance it may be wise to assess at 20 per cent. or less. Cases uncomplicated by enlargement, but showing only fair exercise tolerance, fall in the "effort syndrome" group and start with an assessed disability of 20 per cent.; if a history of rheumatic fever is present they obtain an extra 10 per cent., thus rising to the level of early mitral stenosis with good exercise tolerance. If slight enlargement is added to regurgitation, the assessment is from 20 to 50 per cent. (see enlargement group in the table), according to the exercise tolerance and the presence or absence of a history of rheumatic fever. Consideration of the murmur itself is not only unnecessary in assessing, but would lead to endless difficulty in fair assessment.

Table of Percentage Disabilities.

	Per Cent.
Effort syndrome (with or without systolic apical murmur):	
With fair exercise tolerance	20 or less
With poor exercise tolerance	30 to 40
For history of recent or repeated rheumatic fever or for poor development	add 10
Mitral stenosis:	
Early and uncomplicated with good exercise tolerance	30
Early and uncomplicated with poor exercise tolerance	50
Developed uncomplicated with fair exercise tolerance	50
Developed uncomplicated with poor exercise tolerance	60
Developed with enlargement	70
Developed with enlargement and venous engorgement	80
Developed with fibrillation (untreated), but no enlargement	70
Developed with enlargement and dropsy	100
Aortic disease:	
Slight and uncomplicated with good exercise tolerance	40
Slight and uncomplicated with poor exercise tolerance	60
Developed with much enlargement	80
Developed with enlargement and engorgement or angina; fully developed with enlargement and renal disease	100
Enlargement:	
Slight but definite with good exercise tolerance	20
Slight but definite with poor exercise tolerance	40
Moderate with poor exercise tolerance	50
Great with poor exercise tolerance	70
For untreated fibrillation or venous engorgement	add 30
For history of rheumatic fever (recent or repeated)	add 10
General arterial disease:	
Uncomplicated with good exercise tolerance	20
Uncomplicated with poor exercise tolerance	40
With moderate cardiac enlargement	50
With high blood pressure / With grave angina pectoris / With great enlargement / With renal disease / With venous engorgement / With or without fibrillation	70 to 100
Aortic aneurysm	70 to 100
Angina pectoris	50 to 100
Fibrillation of auricles (or persistent flutter):	
Without signs of cardiac failure	50
With fair exercise tolerance and untreated	50
Paroxysmal tachycardia:	
Mild and infrequent attacks	less than 20
Severe and infrequent attacks	30
Severe and frequent attacks	50

QUESTION 24 (*b*).* *In case of aggravation or where there is any evidence that there was a disability on entry, what in your opinion was the degree of disablement which existed at the time of joining the army?*

The answer to this question should be expressed as a percentage. The chief points for consideration in "effort syndrome" cases, which have arisen before enlistment,

* It is not stenosis of the mitral valve which chiefly disables, but the injury to the heart muscle which is associated with this lesion.

* Question 12 *b* of Form Z 22 is answered similarly.

are (*a*) an estimate of exercise tolerance immediately before enlistment, (*b*) the effects of infection, shell shock, gassing, etc., after joining, or any other event happening on active service which is known notably to aggravate. In cases of real heart disease arising before enlistment aggravation may always be considered to have occurred where any material service has been given. Precisely the same points come up for consideration as in the "effort syndrome" group. In general, in a case of heart disease, the lowest percentage disability given for the diagnostic group to which the man belongs in the disability table may be taken as the *maximal* (though not necessarily the minimal figure) for the disability at *enlistment*. This is recommended because although a lesion, such as early and uncomplicated mitral stenosis or aortic reflux, may have passed unnoticed by the recruiting board, being often in the pre-diagnosable stage, such lesions, in the presence of complications, could scarcely have remained undiscovered. The complications may therefore in general be viewed as "aggravations." Thus, in a case of mitral stenosis arising in civil life the disability on enlistment should be placed no higher, though it may be placed lower, than 30 per cent.

Where there is uncertainty the benefit of the doubt should be accorded the man, and the original disability fixed at a low percentage. If in arriving at the full disability, 10 per cent. has been added for poor development or for rheumatic fever *acquired before serving*, then it must also be added to the assessment of disability on joining.

THE COMMON FACTOR IN DISORDERED ACTION OF THE HEART.

BY

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THE group of cases spoken of as disordered action of the heart (British), neuro-circulatory asthenia (United States), effort syndrome (Dr. T. Lewis), irritable heart of soldiers (Da Costa), includes those having the common symptoms of breathlessness, palpitation, precordial pain, and exhaustion. Additional symptoms suggesting the functional involvement of every system in the body may be present, but, on account of their prominence, those referring to the circulatory and the nervous systems are the most evident.

That these two systems are disturbed is shown by the anxious, listless expression, the nervousness, tremor of the muscles, increased reflexes, dizziness, giddiness, or fainting, and changes in the blood pressure and pulse. We could subdivide the cases into groups, such as the psychic, cardiac, involuntary neuro-muscular, or any other which one may fancy; but such a procedure, while it may be descriptive to some extent, does not advance us in dealing with the condition, and might be misunderstood.

"D.A.H." is always secondary. Its primary cause may be found as far back as the family history where life began under the burden of some hereditary taint, but usually the primary factor will be found as some infection, accident, injury, or in single or repeated mental shocks. Such events will be evident in the history of the individual as a turning-point in his life, as since then he has been unable to make the physical effort he had formerly been able to accomplish without distress.

As a matter of fact, the condition of the circulatory system during an acute attack of fever does not differ materially from that which we find in D.A.H. In both we have the same breathlessness, palpitation, precordial pain on exertion, and vasomotor disturbances on changes in position or after exertion; in some cases the same fast pulse; in others, like typhoid or cerebro-spinal fever, a relatively slow pulse. Our custom, when these symptoms appear during the course of a fever, is to return them under the nomenclature of the infection; when they are present after all obvious signs of the illness have disappeared, to speak of them under the diagnosis of D.A.H.

It has become so usual to consider that all cases of D.A.H. must be accompanied by a rapid pulse while at rest and after exertion, that I give the following case report of a patient with a comparatively slow pulse, but who has undoubtedly suffered from the condition since boyhood.

Pte. B., 26th Battalion C.E.F., aged 38; born in England. Total service thirty-four months, in France six months.

Complaints. — Breathlessness, dizziness, precordial pain, exhaustion.

Family History.—Mother, aged 68, has always been nervous and weak. Father died of cancer of stomach, aged 56. Five brothers and five sisters. One brother killed in the Somme fighting, another discharged from the army as medically unfit, cause not known; the remainder healthy as far as he knows.

Personal History.—The patient had measles in childhood; rheumatic fever in 1909, when he was in bed for eleven weeks. He has had three attacks of acute tonsillitis. He was not able to play games at school because he was never strong enough. He worked at his trade of carpenter in England with occasional spells of weakness and dizziness until 1898, when he joined the Coldstream Guards as pioneer corporal, and served with them in England and South Africa. During this service he had frequent fainting attacks, and was discharged as medically unfit in May, 1906. He went to Canada in 1911, and worked at his trade with a few interruptions on account of weakness and dizziness. In 1914 he joined the 26th Battalion, and was discharged medically unfit on July 6th, 1915. He then joined the militia of Canada in August, 1915, and did home duty until joining the —— Battalion as sergeant-major. He did eight months' training in Canada, carrying on with difficulty, as he constantly fell out of route marches on account of breathlessness and weakness, and had frequent fainting spells. He did five months' training in England with similar complaints. He reverted to a private and went to France in October, 1917, but was unable to carry on either as regards route marches or front line work, and was evacuated to England on March 15th, 1918, as D.A.H.

Condition on Admission.—Height 6 ft.; weight 164 lb.; extremely depressed and expression listless; tonsils ragged, not enlarged; teeth good; blueness of the hands; no clubbing of the finger-nails. There is not an area of hyperaesthesia. *Urine:* Specific gravity 1018, acid, no albumin, no sugar. Eye and knee reflexes normal. He had an occasional spasmodic twitching of the muscles in different parts of the body. *Circulatory System:* Pulse 60; after a measured exercise 100, in one minute 60. Heart apex beat fifth left interspace in nipple line fairly diffuse. Area of cardiac dullness: left limit outside left nipple line 12 cm. from the mid-sternum. *Sounds:* A faint systolic murmur in all areas, heard on lying down only. Rhythm irregular; immediately after exercising the disturbance disappears; with deep respirations the irregularity is increased.

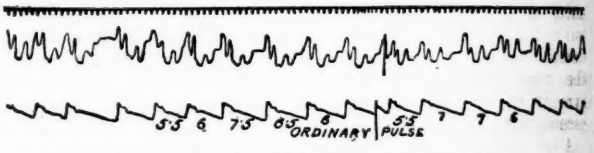

FIG. 1.—Pulse tracing with ordinary breathing.

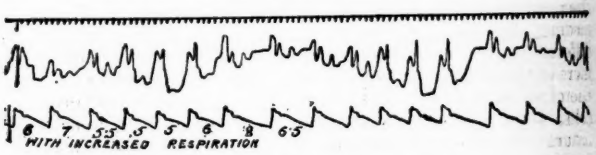

FIG. 2.—Pulse tracing with forced breathing.

Under digitalis, ηxx four times a day for four days, the pulse remains as shown in the tracing. Under tincture of belladonna, ηx four times a day for four days, the rhythm became quite regular, and was then not disturbed by increasing the respirations.

While it is not usual for these cases to be accompanied by a gross pathological lesion, the presence of such a change does not prohibit a coincident D.A.H. which may depend upon the same or some other etiological factor. In any case an obvious lesion, when present, is the chance involvement of a susceptible tissue, and is quite apart from the actual bodily changes which are present in D.A.H. I might express this in a different way as "history of rheumatic fever, typhoid fever, or any other illness is of sufficient importance to be considered by itself, quite apart from any local change."

In the case reported we have (*a*) disordered action of the heart which has been present since boyhood; (*b*) a pathological change in the heart (hypertrophy and some irregularity of the *a-c* interval); (*c*) a dominant vagus nerve.

In the ordinary normal person we do not find the nervous connexions of the heart especially evident, as they

are nicely balanced, or, at least, are only evident under special stimulation.

Such response of heart muscle to vagus as occurs in this case will throw doubt on Sir James Mackenzie's suggestion[1] that this demonstration is in favour of a heart muscle which has escaped damage. In this case at least, where the vagus overcomes not only its usual reticence, but also an abnormal heart muscle, we are driven to consider some factor which is behind the nerve, stimulating or intensifying its action to determine its ascendancy. The usual case of D.A.H., on the other hand, has a rapid pulse because the exciting factor has an affinity for and enhances the action of the cardiac sympathetic.

In the diagram I have shown the parts of this subject we know. They are predisposing factors which initiate the bodily changes giving rise to end results of circulatory disturbances and physical and psychical exhaustion. Between these two there must be a common factor which regulates the disturbed intercellular phenomena. I do not think we should be diverted from such a solution because the primary factor happens to come from various directions and in different forms.

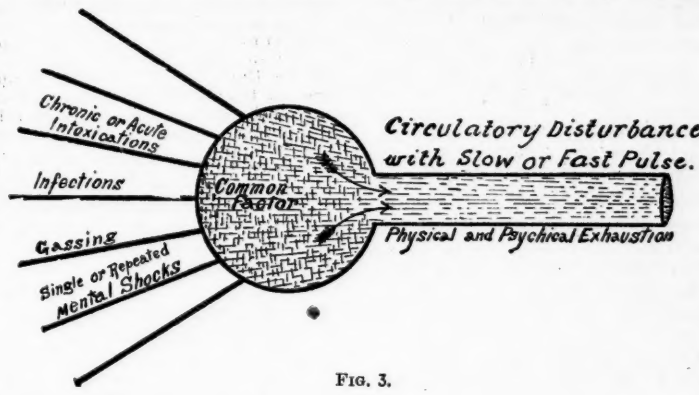

FIG. 3.

For a solution of this problem the autonomic nervous system must form one part of the equation. Anatomically, this system is divided into:

1. Cranial.
2. Thoracic-lumbar or sympathetic.
3. Sacral.

The sympathetic division is widely distributed throughout the body, while the cranial and sacral portions have only a restricted field. Physiologically, the divisions differ, as, when branches of the middle or sympathetic division meet in any organ with branches from either the cranial or sacral portions, their effects are antagonistic. Normally the opposed actions are balanced, but under various conditions one or other section may predominate, and, in the heart in D.A.H., we may find either the vagus representing the cranial portion, or the sympathetic representing the sympathetic portion in the ascendancy.

A second factor in the equation would be the circulating fluids which, in health, contain the nutritional and chemical needs of the body and act as a nicely balanced medium for the correlation and mutual benefit of the different cells and functions. From our slight but gradually increasing knowledge we know that these fluids are the chemical results of cytoplasmic activity of all the different cells, some merely metabolites, but others of a specific nature differing chemically and physiologically but greatly dependent on one another for their entrance into the circulation, and all required by the individual systems in a pure state in order that they may perform their functions correctly.

We have abundant evidence that these bodily secretions are further influenced by the infections, by prolonged exertion, and by emotional excitement. During the siege of Paris, 1871, Graves's disease was common. Alexander notes a case of Graves's disease following a bomb explosion.[2] In this clinic almost every day we see cases with some enlargement of the thyroid, and symptoms which suggest its disturbed function. While recognizing that hypertrophy of this gland does not necessarily include an altered function, the possibility of a thyrotoxin remains uppermost in our minds because we have no method of determining its presence or absence in the blood.

Ramond and François,[3] during a few months of 1917, were able to collect 26 cases of confirmed Addison's disease in their hospital sector in France. They concluded that the increased evidence of this condition is due to the slow, progressive, positive suprarenal insufficiency, in consequence of the continual state of moral and physical tension inseparable from this prolonged war. It is also of importance in this connexion that two of their cases were associated with Graves's disease.

W. B. Cannon[4] has shown that in the primary emotions Nature has increased our reservoirs of power by increasing the output of adrenalin, by mobilizing the energy-giving sugar of the liver in the circulation, and by increasing the coagulation time of the blood. In this way the organism is made more effective in a display of energy; fatigue is abolished, and some provision made for the conservation of blood in case of accident. Such responses to the emotions are in the nature of reflexes, and denote a neuro-chemical relationship between the circulating fluids and the nervous system. By stimulation of the sympathetic Cannon was able to deplete the adrenal glands of their active principle in a very short time. It will not be denied that a similar stimulation occurs in the recruit during the time he is being imbued with the ardour and the skill of warfare, as well as during his presence in the field when a soldier.

In the infectious diseases and other debilitating conditions the function of the adrenal gland became altered in a similar manner. F. Lucksch[5] gives the disturbance as a depletion of the gland itself. He gives the normal amount of adrenalin as 4 mg. per gram of dry adrenal weight. This figure falls in the infectious and other diseases, and may reach 0.35 mg., or in infants 0.13 mg. In Addison's disease the figure is lowest and in nephritis the highest.

That depletion of the adrenals in itself has a marked influence on the general economy, and that it must influence the functions of all the organs, is shown by the work of Athanasiu and his pupil Grandinesco, who are quoted by Gley.[6] They found that adrenalin, by the tonic influence it exerts on the endothelium of the blood capillaries, regulates material changes between the blood and the interstitial plasma of the tissues, so that, if the secretion of this product is abolished, these exchanges are put in a state of profound disorder. In the light of this evidence one might be tempted to consider the positive suprarenal insufficiency as the solution of our problem, and, while important, it is only one of a number of chemical products found in the circulating fluids, each one of which is dependent on another for stimulation and assistance in its functions, and each influenced by and influencing all the other cells of the body, so that a consideration must include the entire chemical content of the blood. Our information so far then shows that in the circulating fluids we have products of a chemical nature; that disease and nervous stimulation affect at least the quantity of the chemical elements entering the blood.

That a further qualitative change takes place is also certain, because the alkaline balance of the mixture has been altered. Bayliss,[7] Moore,[8] Barcroft,[9] and other physiological chemists are agreed upon this point. At present they happen to be engaged in a controversy as to whether it is the alkaline salts or the amphoteric proteins which are interfered with, and as to whether the protection of normal blood acts as a "buffer" or as a "tampon," but the general opinion seems to be that the hydrogen ion concentration of the blood has been interfered with. This is an important fact, and must be associated with the disturbance of the balance in the internal secretions.

There is, as yet, no absolute proof that this acidosis in D.A.H. is the result of a chemical change in the internal secretions, but the certainty of a quantitative change in some of them I have shown, and as chemically they are dependent upon each other but cannot replace one another, it is surely a fair inference that, in the reciprocal reactions of excitation and inhibition which go on between them, and when their balance has been lost as we have shown in this condition, one at least of their number, let us say, in an attempt to replace the functions of another, forms compounds which are abnormal and acid in reaction. This is no doubt rendered easier by reason of increased sugar

present in the blood, which so easily lends itself to the formation of acid compounds.

Clinical observation of the respirations in cases of disordered action of the heart does not favour the theory of acidosis due entirely to deficient lung ventilation. The respiratory centre and muscles come primarily under the influence of altered circulating fluids, their function is interfered with, and the increased contribution of hydrogen ions they make to the circulation is secondary.

We know from physiological and from clinical experience in different diseases that certain compounds stimulate one or other divisions of the autonomic nervous system. The case I review in this paper is one instance where the vagus is under such control. The rule, as we know, is for stimulation of the sympathetic. I only point out that such is the action of various abnormal circulating fluids.

In D.A.H. it is not only the respiratory and autonomic systems which are disturbed, but the changes in the function of the psychic, cardiac, locomotor, and other systems are so pronounced as to suggest the cases being grouped into psychic, neuro-muscular, cardiac, etc. Such abnormal intercellular phenomena are accompanied by a mechanism apart from the nervous system, and must result from the intermediary action of the circulating fluids acting either (*a*) directly, by bathing the cell in an abnormal chemical compound which may initiate a change in the chemical reaction of the cell itself, or possibly change the arrangements of the protoplasm and nucleus; (*b*) more indirectly, through the action of these fluids on the endothelium of the capillaries interfering with material exchanges between the blood and the interstitial plasma.

I have attempted to prove that it is in the body fluids we have the common factor of disordered action of the heart. The rôle of the autonomic system is that of the small child who starts the motor car and is unable to pull the levers of control. By means of its more or less continued stimulation, a vicious circle begins—(1) stimulated autonomic system; (2) altered body fluids; (3) altered function—in which all systems, including the autonomic system, take a part. Similar changes take place, we have seen, in the acute infections and other diseases, and are followed by similar symptoms; their importance in the history of D.A.H. being that once the vicious circle has been created, it is entered upon again more readily. The relation of single or repeated mental shocks depends on the degree of shock and the stability of the autonomic nervous system.

I have never seen a satisfactory explanation of the symptoms of D.A.H., but, having followed me so far, if you will understand the sense in which I use the word "exhaustion" as being synonymous with malnutrition of the cells owing to the chemical alteration of their necessary food, I will try and apply them to my solution of D.A.H.

Breathlessness, especially on exertion, is the most common symptom of this condition. If we were dealing with a normal respiratory centre and muscles, and with blood which was normal, except for the addition of hydrogen ions as a result of deficient lung ventilation, we would surely have such a response of the centre and of the muscles that any disturbance of the potential alkalinity of the blood would be corrected.

The arrangement, we have seen, is that the circulating blood has its alkaline balance disturbed, quite apart from the respiratory system, and that a further disturbance of this balance occurs as a result of deficient lung ventilation. The respiratory system in these cases cannot be judged by ordinary standards. The centre bathed by abnormal fluids, with function either inefficient or exaggerated, is on a different plane. The respiratory muscles have every evidence of exhaustion. We know that with increased hydrogen ion concentration the avidity with which the blood gives up its oxygen is accelerated, so that, considered clinically, it would appear that both the centre and the blood required to be further activated by carbon dioxide in order to obtain the necessary response for ordinary effort. This explanation does not pretend to be anything more than an attempt to correlate the clinical appearance of respiratory action with certain changes in the blood. I bring it forward with considerable trepidation, but with the certain feeling that an analogy does not exist between the experimental injection of lactic or other acids and the autogenous disturbance of circulating fluids such as we have present in these cases.

Precordial Pain.—Starling[10] has shown that the reserve power of the heart is enormous and is dependent almost entirely upon its nutrition. The cardiac pain, whether accompanied by hyperaesthesia or not, is merely the distress signal of an organ compelled to work in spite of a food supply, at least altered chemically. In Meakin's series of cases of hyperaesthesia[11] two cases with a known toxic factor support this—one an appendix case with an area of hyperaesthesia on the right abdomen, as well as a precordial area; and the second case, one of chronic dysentery with an area of hyperaesthesia on the left abdomen, as well as a precordial area. In both of these cases, with the cure of the primary condition and the disappearance of the toxin, not only the local but also the precordial hyperaesthesia disappeared.

Palpitation is the outcome of an overacting heart, or of extrasystole, and with the exhaustion, the vasomotor and other symptoms are explained by the changed character of the body fluids interfering with function.

This paper must not be considered as more than clinical, based on observation and on deductions which the writer hopes are within reason. It should direct attention to the importance of all debilitating factors in the life-history of the individual, which, although disappearing without trace, nevertheless have created a vicious circle which readily recurs, and under any stress will reappear and alter every function of the body, mental and physical.

The final solution of problems involving disordered functional correlations of a chemical or neuro-chemical nature must remain in the hands of the physiological chemists.

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INTRAVENOUS INJECTIONS OF ANTIMONIUM TARTARATUM IN BILHARZIOSIS.

BY

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SINCE May, 1917, we have been treating bilharziosis (rectal and vesical) at the Khartoum Civil Hospital by the intravenous injection of antimony tartrate, and I am convinced of its efficacy.

So far as our present knowledge goes—leaving out of consideration for the present antimony—there is no cure for bilharziosis excepting time, and there is no drug to which bilharziosis will directly respond even in the feeblest way. Symptoms may be alleviated, and even temporarily suspended, by rest in bed, by dieting, and by symptomatic treatment; but, after all is said and done, there is, so far as I know, no drug (again excepting antimony) which has the slightest direct effect on the career of the *Schistosomum haematobium* in the portal circulation and its tributaries.

The intravenous injection of antimony tartrate (details of which I have recorded elsewhere[1]) has a profound effect on the symptoms of bilharziosis. One may safely say that, so far as subjective and objective signs are concerned, a cure is effected; one cannot say at this present time that the cure is permanent (it certainly lasts for weeks and months). The permanency of the cure still remains to be probed.* The remedy, no doubt, must be administered with ordinary care, and with the judgement which obviously is due whenever a powerful and toxic drug is used, but it appears to me that antimony tartrate

* Cases so treated months ago are under observation, and will be reported on in due course.

is a specific in its action on *Schistosomum haematobium* as it is in its action on the Leishman-Donovan body (Leishmaniasis).

The following is an account of a case treated by Dr. Nicola Malouf, now practising in Khartoum, with his notes. It is interesting because not only does it in a short account give the typical course of the progress of vesical bilharziosis under treatment with antimony tartrate, but it shows that, with due care, the remedy may be administered without the necessity of the patient lying in bed for a month, or, in fact, without his having to go to bed at all. In point of fact the case was treated in the out-patient room of a private practice. The patient was detained for a short time after the injection at the surgery, and lay down on his bed for the rest of the day of injection at home. He went about his business in the interval as usual.

Abbashur Musa, a native of Wad Medani, 20 years old, a cultivator, visited Dongola in the years 1912–13, and returned with blood in his urine. His urine was nearly half blood and half urine at the time injections commenced; it was never clear. A sample was sent on August 13th, 1918, to the Wellcome Tropical Research Laboratories, Khartoum, and heavy infection with ova of *Schistosomum haematobium* reported. The patient had tried many medicines, especially extract of male fern, but without any effect whatever. He had had no previous disease, and complained of nothing except his urine and of some swelling and pain in the right testicle which he attributed to the same disease.

Method of Treatment.

A stock solution of tartar emetic, gr. 1 in each 20 minims of distilled water, was prepared, and each 20 minims of this was mixed with 30 minims of sterilized normal saline solution before injection. The antimony tartrate solution was always injected into the right median cephalic vein. The treatment was begun on August 15th, 1918.

Date.	Dose.	Untoward Action or Result.
1918.		
Aug. 15 ...	gr.½	*Nil.*
„ 17 ...	gr.1	*Nil.*
„ 19 ...	gr.1½	Cough moderate.
„ 21 ...	gr 2	Severe cough.
„ 23 ...	gr.2½	Severe cough.
„ 25 ...	gr.2½	Severe cough; patient stated urine clear for the first time in the last four years.
„ 27 ...	gr.2½	Severe cough, eyelids and face puffy, appetite lost, felt very weak, cold hands, pulse 100 and weak, temperature 98° F.
„ 30 ...	gr.2	Same symptoms but mild.
Sept. 3 ...	gr 2	Patient was given gr. ½ codeine phosphate thirty minutes before the injection; cough not so troublesome.
„ 11 ...	gr.2½	Cough very severe, puffiness of face and eyelids returned, colour of face ash-like, cold sweat.
„ 15 ...	gr.2	Codeine gr. ¾, in three doses at half-hour intervals before injection; cough moderate, no other untoward action.
„ 20 ...	gr 2	Codeine as on previous occasion with same result. Patient wanted to stop treatment as he believed he was cured.
Oct. 1 ...	gr.2	No complaint of special interest.
„ 3 ...	gr.2	No complaint of special interest.
„ 7 ...	gr.2	No complaint of special interest.
„ 12 ...	gr.2	No complaint of special interest. The last injection.
Total ...	gr.31	

It will be seen (1) that for five years the patient had had haematuria, that his urine was never clear during four of these five years. (2) That after the fifth injection the blood in the urine disappeared and the patient stated that it was the first time for four years that his urine had been clear. (3) That after the twelfth dose the patient was convinced that he was cured; he may have been, but the course was continued by Dr. Malouf until he had given gr. 31, in fifteen doses varying from gr. ½ to gr. 2½, in fifty-six days. The urine, owing to the exigencies of private practice, was not tested every day.

There were two breaks in the course of the treatment. One of eight days and one of ten days. These lapses did not apparently make any difference to the final result, and it is interesting to note that the cause of the ten days' lapse was Spanish influenza, so that in a man with healthy organs, Spanish influenza complicating the course of injections of antimony tartrate need have no untoward result.

The cases treated at the Khartoum Civil Hospital have the urine microscoped every day. The urine of the case being reported here has been tested half a dozen times since the injections ceased; it contained nothing abnormal. I am quite aware that a sufficient interval has not elapsed in the present instance to make any statement regarding the *permanency* of the cure, but no drug which I know of has even the temporary effect on the subjective and objective symptoms of bilharziosis that antimony given as antimony tartrate has; this effect is certainly profound and striking.

In the only *post-mortem* examination I know of—in a case which had died during a course of treatment by antimony tartrate injections for bilharzia—I am informed that no worms were found in the portal circulation (the *post-mortem* examination was made a very few hours after death). This is an interesting and important statement and significant.

I have elsewhere[2] drawn attention to the care and judgement necessary in dealing with a disease by the use of a powerful remedy such as antimony tartrate. It should be remembered that it is a poison, that even small quantities have been known to cause death (gr. ½ in a child, gr. 2 in adult), to say nothing of the risk of chronic antimony poisoning, that the injection is made directly into the veins, and its use requires additional care by reason of this fact.

Intercurrent diseases of the heart, liver, kidneys, lungs, should be looked for, and the metabolic processes of the body so far as possible should be sound; if not normal, they are additional causes for circumspection.

I think gr. 30 should be considered for the present the maximum dose for an adult's course for bilharziosis, and, if more be required, a second course of injections should be administered after an interval of some weeks or months. It may be that, as more is done on this treatment, a much smaller dose will be found to be the required killing "charge." It may be, and very likely is, the case that some cases only require a comparatively small dose whilst others require a dose of gr. 30 or more, and that others again require several courses of gr. 30 to rid them of the bilharzia worms.

It is almost certain that tartar emetic will have a deleterious effect on organs and tissues when given recklessly, empirically, and without the sense of responsibility which is due to the act of injecting anything—however benign, however poisonous—into another human being's veins.

There are still sufficient empirics in the medical profession to damage again the reputation of tartar emetic (antimony) as a valuable remedy. Such a result would be a calamity now that it appears to be taking its proper place as one of the most powerful and useful germicidal agents we possess; and I think this note of warning is necessary, because it is in partially civilized countries where the diseases—leishmaniasis, sleeping sickness, and bilharziosis—which are amenable to treatment by antimony abound. There also the methods of the quack and charlatan flourish, encouraged by the ignorance and prejudice of the native races.* I beg to acknowledge with thanks the help I have received from Mr. J. R. Newlove in this work.

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FIBROMA OF THE TRACHEA.

BY

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FIBROMATA of the trachea, though they occur second in frequency amongst all innocent tumours found in this region, are nevertheless, I think, of sufficient rarity to justify the publication of such a remarkable case as that about to be described.

StClair Thomson[1] states that fibromata of the tracheal lumen occur second in frequency to papillomata, but Sauer[2] has only been able to collect published records of

* In the tropics there is a diversity of medical talent, as one would expect from the diversity of the nationalities of the doctors. In the eyes of the tropical public doctors are all the same. They are medicine men, and there is nothing medical which is revealed to one and not the others. Most of the local doctors are altogether empirical in their ways of treatment, and the treatment of kala-azar in the Sudan (by antimony tartrate) has, no doubt, not come up to expectation in their hands. This is, however, no reflection on the efficacy of the treatment when carried out intelligently.

twenty-nine cases, which fact amply demonstrates the extreme rarity of such tumours in the trachea.

The patient, P. S., aged 9 years, was sent to me by Dr. Harrington of Tralee with the provisional diagnosis that he was suffering from an intratracheal tumour. One of his brothers had died of diphtheria at the age of 8 years. The family history was otherwise irrelevant. The personal history was that with the exception of an attack of bronchopneumonia five years previously the boy had always enjoyed robust health until he had contracted measles three months ago. Since then he had had irregular attacks of dyspnoea, which, having increased in severity, especially at night, necessitated his being taken to the doctor two weeks before I saw him.

As his respiratory difficulty failed to yield to palliative treatment after one week, the advice of a throat specialist was recommended, but was not sought until a week later, by which time the urgency of the boy's condition had become very acute.

When I saw him on August 10th the patient presented all the clinical signs of almost total tracheal occlusion. He was unable to walk unsupported, his face was livid and anxious, and his voice very feeble but clear. His pulse was accelerated and feeble. There was orthopnoea and marked stridor, especially during inspiration. The lower sternal and costal cartilages, as well as the upper abdominal parietes and suprasternal notch, were in a state of permanent and very decided retraction.

No breath sounds could be heard with the stethoscope in either lung, but a loud vibratory sound was audible over the upper central sternal region. Upon examination the pharynx and larynx were seen to be normal. Examination of the trachea carried out by means of the Avellis procedure enabled me to see what appeared to be a dusky red, globular tumour, situated very low down in the trachea.

It was evident that immediate relief was necessary, but that any attempt to remove the tumour by upper direct tracheoscopy would under the existing condition of the patient be highly inadvisable. I accordingly decided to perform a low tracheotomy, and hoped thereby that if I were unable to effect a removal of the tumour at once I would at least gain a respite.

General anaesthesia being out of the question, I infiltrated the skin with novocain-adrenalin solution and proceeded to do as low a tracheotomy as possible. After exposing the trachea, and whilst in the act of ligaturing a large vein which crossed my intended tracheal incision, the patient suddenly lost consciousness and ceased to respire. An assistant at the same time informed me that the radial pulse was absent. I had artificial respiration adopted and pituitrin injected hypodermically whilst I immediately stabbed the trachea. I now found that the tumour mass lay below the longest tracheotomy tube available, but as natural though very laboured breathing had returned I had time to improvise a further course of action.

The tracheotomy tube was removed, and holding the tracheal rings apart with a small self-retaining mastoid retractor I inserted a small Luc's nasal forceps in the direction of the bifurcation, grasping and removing a hard pediculated tumour. Breathing at once became easy and consciousness returned.

The tracheotomy tube was left in, a few deep and superficial sutures uniting the soft parts above it, but was removed the next morning. As the patient's general condition rapidly improved I decided to make a lower tracheobronchoscopic examination. This was carried out five days after the removal of the tumour, the original wound being reopened for the purpose. The examination was carried out under ether-chloroform anaesthesia, $\frac{1}{100}$ grain of atropine sulphate having previously been given hypodermically. The site of origin of the tumour was easily verified on the anterior tracheal wall immediately above the bifurcation and cauterized by a very localized application of trichloracetic acid.

The patient made an uneventful recovery, and returned home within a week of this examination.

Upon macroscopic examination the removed tumour was found to be bilobular, the two portions being united at their base and lying together so as to form a globular mass, which was approximately the size of a small cherry. It was dusky red in colour, of fairly hard consistence, and the common pedicle was distinctly evident. Dr. Brönte, to whom the specimen was sent for microscopic examination, reported that it was a fibroma, and consisted chiefly of fibrous tissue and blood vessels covered by compound epithelium.

I am inclined to the opinion that the tumour lay straddlewise across the bifurcation of the trachea and that any air reaching the lungs did so across the upper and posterior surface of each lobe of the tumour. Apart from the site of origin of the pedicle and the findings at operation, the size of the tumour when viewed *en masse* was such as to preclude the possibility of the patient living any time had the tumour occupied the trachea alone. Brünings[3] states that from his investigations carried out *in vivo* he finds that the tracheal diameter in children—and by children he expressly states that he means about ten years of age—varies between 8 and 11 mm. The smallest diameter of the tumour referred to above was 1 cm. In this respect I think that my case is unique amongst the sparsely reported cases of tracheal fibromata. For an innocent tumour a further very unusual if not singular feature of this case was the anterior attachment of the tumour pedicle. Woods[4] reports a somewhat similar case of a non-pediculated innocent tumour in a boy aged 11. In this case the growth, which was reported to be "a round-celled growth with many blood vessels and apparently granulation tissue," had its origin from the right wall of the trachea immediately above its bifurcation. Woods succeeded in removing his tumour piecemeal by upper direct tracheoscopy under general anaesthesia, but the general condition of his patient was never serious. In both cases the symptoms were of not more than a few months' duration, though in my case it must be assumed that the tumour in some form must have been present for a much longer period, and it is interesting to note that it was apparently unaccompanied by dyspnoea or other symptoms until after the attack of measles.

Thomson[1] states that tracheal tumours occur most frequently on the posterior wall, and that their frequency diminishes as the tube descends. From the records of published cases—both benign and malignant—I am not inclined to agree with the latter part of this statement, and am rather of the opinion that whilst the subglottic region is most frequently affected the lower end is affected next in frequency, and that the middle region is the least likely to be involved. Theisen[5] remarks that tracheal tumours grow most frequently from the posterior wall, which is rich in mucous glands. This writer further says that owing to the relatively high proportion of tracheal tumours—which he estimates at about 50 per cent. of the total—which prove to be malignant, a strong suspicion of malignancy should always be attached to a tracheal tumour.

Guisez[6] reports the successful removal *per vias naturales* of two tracheal fibromata the pedicles of which were attached posteriorly.

Adam[7] reports the case of an epithelioma about half the size of a cherry with a broad base growing from the tracheal wall just above and half obscuring the right bronchus, which he removed through a low tracheotomy wound.

Heymann[8] records the case of a carcinoma growing from the anterior tracheal wall to the right of its union with the right bronchus.

Moritz Schmidt[9] in his textbook mentions the reports of three cases of tracheal fibromata, one of which was removed through a tracheotomy wound, but he is not specific as to their sites of attachment.

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TILL recently there were only two medical schools in the Argentine Republic, at Buenos Aires and Cordoba, but a third has now been established at La Plata.

THE *Indian Medical World*, Calcutta, has published a chart of pathogenic bacteria for the use of candidates for the M.B. examination. It appears to have been prepared with care, and may no doubt be of use to students who have diligently followed a course of bacteriology.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ACIDOSIS.

"ACIDOSIS" has generally been looked upon as a symptom. From the many cases I have treated in this hospital simulating pulmonary and cerebral complaints, I have come to the conclusion that acetone intoxication is a cause, producing symptoms in some cases of pneumonia, in others of meningitis, etc. How acetone is produced I will not discuss. My reason for writing is to put the general practitioner on his guard, as recently we have had several cases sent in during this epidemic as influenza pneumonia which on examination I have found to be acidosis. The following cases, related as short as possible from the history sheets, will show the importance of the subject. All have been treated with sodium bicarbonate and glucose. As soon as the acetone cleared up all the other symptoms disappeared.

Case 1.—Child, aged 6½; admitted April 8th, 1918. Temperature 98°, pulse 120; quite comatose. History of one week's illness, with vomiting, cough, and abdominal pains. Acetone cleared on the ninth day; discharged on the seventeenth day after admission.

Case 2.—Child, aged 6½. Ill two days with abdominal pains, sore throat, and some vomiting. Was comatose when admitted on May 23rd as a case of meningitis. 7 p.m., Temperature 101°, pulse 110; 11 p.m., temperature 104°, pulse 130. The acetone cleared in seven days; discharged June 3rd.

Case 3.—Child, aged 6; sent in as a case of pneumonia on June 14th. Temperature 102°, pulse 140. History of two days' illness with vomiting, cough, headache, and dyspnoea. The acetone cleared on the seventh day; discharged July 1st.

Case 4.—Child, aged 6½; sent in as a case of meningitis on June 14th. Temperature 101°, pulse 135. Had slight convulsions which continued till 9.30 the next morning. Acetone cleared in seven days; discharged July 1st.

Case 5.—Child, aged 6; sent in as a case of pneumonia on July 7th. Temperature 100.3°, pulse 140. Two days before admission was taken with acute headache, vomiting, and abdominal pains. Acetone cleared on the sixth day; discharged July 25th.

Case 6.—Boy, aged 5; sent in as a case of meningitis on September 17th. Temperature 100.2°, pulse 116. Had convulsions on the 16th, and on the morning of the 17th was found in bed quite comatose. Had slight convulsions after admission. Acetone cleared on the ninth day; discharged October 17th.

Case 7.—Child, aged 7; admitted on September 23rd as a case of meningitis. Temperature 105°, pulse 124. Acetone cleared on October 1st; discharged.

Case 8.—Boy, aged 12; sent in on October 1st as a case of bronchopneumonia. Temperature 101.2°, pulse 103. Ill seven days before admission. Acetone cleared on October 9th; discharged.

Case 9.—Man, aged 28; sent in as a case of meningitis on October 9th; quite comatose and difficult to rouse. Temperature 101°, pulse 56. History: On October 4th, on returning from work, he complained of pain in his head; vomited a good deal of yellow fluid. Next day he became comatose. Acetone cleared on October 24th; discharged October 28th.

The following were sent in as influenza pneumonia cases:

Case 10.—Female, aged 19; admitted October 26th. Temperature 102°, pulse 120. Acetone cleared November 3rd; convalescent.

Case 11.—Aged 19; admitted October 26th. Temperature 100°, pulse 120. Acetone cleared on November 4th; convalescent.

Case 12.—Aged 17½; admitted October 27th. Temperature 102.4°, pulse 156. Acetone cleared on November 1st; convalescent.

Case 13.—Female, aged 25; admitted October 28th. Temperature 99.4°, pulse 112. Acetone cleared on November 3rd; convalescent.

Case 14.—Female, aged 31; admitted October 28th. Temperature 103°, pulse 144. Acetone cleared on November 3rd; convalescent.

No case took more than nine days to clear up. None of the supposed meningitis cases showed Kernig's sign. The breath in several cases pointed to acetone.

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IMPLANTATION OF THE NEWLY FERTILIZED OVUM IN THE UTERUS.

CASES of full-time extrauterine pregnancy and of advanced ectopic gestation like that recorded by Dr. Nash in the JOURNAL of October 12th raise grave doubts regarding two prevalent beliefs concerning the part which it is alleged the corpus luteum plays in preparing the endometrium for the reception of the newly fertilized ovum and the way in which the fecundated ovum perforates and lodges itself in the substance of the uterus. If there is at any time a justifiable reason for the fertilized ovum in man assuming the attitude of a parasite towards the tissues of its own mother it most assuredly would be manifested when the fecundated ovum finds itself located disadvantageously in some alien quarter.

When the embryo completes its development and arrives at maturity in some location outside the uterus the placenta is as perfect structurally and functionally as when it develops in the uterus itself. In such circumstances the belief cannot be entertained that the corpus luteum plays any part in preparing and favouring the maternal tissues for the implantation of the fertilized ovum, nor yet for the assumption that the ovum through the agency of the cells of the syncytium eats its way into the maternal tissues. By chemiotaxis the fertilized ovum, both inside the uterus and in any other location in which it chances to be advantageously circumstanced, can accomplish everything. We have, moreover, from comparative anatomy and clinical human facts the strongest evidence for refusing to accept the tenet that the fertilized ovum in the uterus gets covered over either by a decidua capsularis or a decidua reflexa. Take the case of the whale, where the placenta is constituted from first to last of the entire chorion, or the case of the horned ruminants, where we have a multicotyledonous placenta, the cotyledons being distributed over the whole surface of the chorion. Or take, again, those cases of uterine pregnancy in which a more or less extensive external haemorrhage from the uterine placental site takes place fourteen days after the first suspended menstrual period and in which the haemorrhage may persist for many weeks without the embryo losing its power to complete its development and maintain its existence after birth. In the latter cases the blood must have escaped by bursting the decidual capsule, if there be such a thing.

London, W. JAMES OLIVER, M.D., F.R.S.Edin.

Reports of Societies.

PATHOLOGY OF GAS GANGRENE.

AT a meeting of the Pathological Section of the Royal Society of Medicine, held on December 3rd, with Professor W. BULLOCH, F.R.S., President, in the chair, Dr. J. MCINTOSH, in opening a discussion on the pathology of gas gangrene, observed that gas gangrene did not appear to have been described before the Crimean war. In the British army in the present war the cases amounted to 1 per cent. during its most active phases, and half of these died. The infection was due to anaërobic bacilli, chiefly *Bacillus aërogenes* (*B. welchii*) and that of malignant oedema (*Vibrion septique*), both of which it was difficult to separate from the saprophytic forms, and obtain pure cultures. At the outset *B. aërogenes* had been thought responsible for all; this had proved erroneous. The speaker's results gave: *B. aërogenes* 43 per cent., *B. sporogenes* 27 per cent., *B. oedematis maligni* 19 per cent., with a few cases due to *B. oedemaciens*—all being anaërobic.

Major J. W. MCNEE drew attention to the observations made by himself and Major-General Cuthbert Wallace, which showed that gas gangrene was essentially a muscular disease, extending rapidly in the course of their length; it might be confined to a single muscle. If a large vessel were severed and blocked, the infection involved all the muscles so deprived of blood. The advancing edge of the disease appeared as a paler zone than the normal structure, more translucent and firmer; these effects were due to the action of toxins passing upwards in advance of the bacilli. The good results following early partial or complete excision of the infected muscle had now for some while been established. This treatment had reduced the mortality to 2 per cent. *B. aërogenes* was the chief agent in the earlier part of the war apparently; the *B. oedematis maligni* was of later appearance, this, unlike the former, being found in the blood. Infection with *B. oedemaciens* was uncommon. The earlier use of a single serum (*B. aërogenes*) did not prove so satisfactory as that of the three organisms combined.

Professor WEINBERG (Paris) said that he used a mixed serum—*B. aërogenes, B. oedematis maligni, B. oedemaciens.* The serum treatment had reduced the mortality from 80 per cent. to 0.5 per cent. The serum was injected beneath the skin; into the damaged muscle; and, in extreme cases, intravenously, through a fine needle, an hour and a half being occupied in the procedure. Not only was life saved but limb. The unsuccessful cases proved to be complicated with other conditions.

Major A. W. M. ELLIS had seen good results from serum (*B. aërogenes*); in one case its action was proved by the rapid recrudescence of the disease each time the injection was long delayed.

Captain H. G. N. HENRY had approached the problem by isolating the bacteria from fifty samples of infected muscle; the organisms were *B. tetani, B. aërogenes, B. oedematis maligni.* The use of corresponding serums had proved very efficacious, the few cases of failure proving to be examples of infection with *B. oedemaciens*, streptococcus, and certain organisms not identified.

After a communication by Dr. W. BULLOCK, the PRESIDENT congratulated the speakers upon the excellence of the work carried out, much of it under very adverse circumstances.

CLOSURE OF CAVITIES IN BONE.

AT a meeting of the Section of Surgery of the Royal Society of Medicine held on December 4th, the President, Sir JOHN BLAND-SUTTON, being in the chair, Lieut.-Colonel PERCY SARGENT read a paper on the closure of cavities in bone.

He said that the processes of repair in bone differed in no way from those which occurred in other vascular tissues, but they were modified by its peculiar and complex structure. Tissues healed well or ill according to their vascularity, and so cancellous bone was more adapted for recovery than compact bone, the abnormally dense bone which resulted from chronic inflammation being a great handicap, and the factor which retarded the healing of cavities in bone was the fact that the walls were not collapsible. It was necessary for the walls to be approximated until the granulations which covered them were able to coalesce. Two processes combined to bring about the coalescence of the granulations covering the wall of the cavity: (1) the pulling together of the adjacent structures, and (2) the process of contraction, which was always associated with the development of granulations.

He gave reasons to show that whilst no cavity in bone might be beyond the possibility of obliteration, given sufficient time, yet we had to realize that, for practical purposes, some assistance must be afforded so as to hasten the healing process and bring it about within a reasonable period. Colonel Sargent gave an account of the different methods which had been employed to fill up old bone cavities.

1. In 1886 Schede recommended a procedure based upon the process of "healing by blood clot."
2. Pieces of sponge had been packed into the cavity.
3. Neuber had inverted flaps of skin into the cavity laid open by removal of one of its bony walls.
4. Senn packed the cavity with chips of decalcified bone prepared by soaking in 1 in 500 sublimate in alcohol.
5. Seymour Jones had plugged the cavities with a paste compounded of iodoform, spermaceti, and oil of sesame.
6. Hollander had used melted human fat for the same purpose.
7. Broca had converted the cavity into an open trough by the free removal of one of its walls, the overlying soft parts being then encouraged to sink into and gradually to obliterate the resultant cavity.

His own method was a modification of Broca's operation and might be called that of continuous muscle grafting.

Before undertaking the operation the bone was carefully examined by means of stereoscopic radiograms. The technique of the procedure was as follows:

No tourniquet was employed, as the subsequent oozing was a great drawback. Haemorrhage was easily kept under control by the frequent application of large pieces of gauze wrung out in very hot saline. As a rule, the operative field could be kept dry by this means. Further, it was easier to judge of the condition of a bone which bled under the curette than one which was temporarily deprived of its blood supply. Again, as these operations consumed a considerable amount of time, the total deprivation of blood for an hour or more from skin whose nutrition was already impaired by scarring might result in subsequent sloughing.

One of the most essential points in the operation was to secure a sufficiently thorough exposure of bone both above and below the site of the cavity which was to be attacked. The surgeon must see exactly what he was doing in every part of the operative field, and not trust to the curette for discovering hidden recesses.

He usually began by a fairly wide excision of the wall of the sinus which leads down to the bony cavity. When more than one sinus existed he selected the one which was most conveniently situated, and which gave the easiest and most direct access to the bone, having regard to the anatomy of the structures in the neighbourhood. Any other sinuses might or might not be dealt with, according to their situation and the density of their walls.

The periosteum was next incised, to the extent of the whole length of the wound, and stripped from the bone so as to bare it completely, not only at the actual site of the cavity, but for some distance both above and below.

At this stage it was convenient to employ Lane's bone levers instead of the ordinary retractors, so as to bring the bone into prominence by depressing the soft parts. They are inserted between the periosteum and the bone.

Before attacking the bone it was necessary to pack it off by means of gauze pads, partly to prevent soiling of the wound generally, but particularly to prevent fragments of bone getting lost amongst the soft parts and being accidentally left behind.

That part of the operation which consisted in preparing the cavity for the graft was entirely subperiosteal.

The bone so exposed could be thoroughly examined and a decision made as to which wall of the cavity could best be spared from the point of view of strength of the bone. Other things being equal, that aspect of the bone was selected for removal which was most conveniently related to such overlying muscles as could best be employed for filling the cavity.

These points being decided, the cavity in the bone was fully opened up by means of a chisel and mallet, until every part of it could be thoroughly explored. All granulation tissue and dead or carious bone must be removed and all recesses carefully followed up and cleansed. The cavity was next washed out with hot saline solution, and plugged tightly with gauze. This completed the first stage of the operation.

The second stage was not commenced until all soiled packing had been removed, the towels changed, the instruments resterilized, and the surgeon's and assistant's gloves had been changed. From this point onwards the operation must be regarded as an aseptic procedure.

The best method of filling the cavity with muscle was different in every case; what must be done was to fashion from the most conveniently situated mass of muscle a thick broad-pedicled flap of approximately the same size as the cavity. It was a plastic operation based upon the same principles as those which govern plastic operations in general, and the main point to be kept in mind was to secure an adequate blood supply to the transplanted muscle. The muscle graft was now pushed into the cavity and pressed home firmly; it readily adhered to the bone. A few stitches of catgut might be required to bring together the overlying muscles and to assist in keeping the graft in position. The skin was loosely sutured and the subsequent escape of exudate was provided for by means of rolls of rubber sheeting inserted in convenient parts of the wound. It was important to place one such drain in the space from which the muscle graft had been cut. These drains were usually removed at the end of forty-eight hours. The limb was splinted in such a way as to relax the parent muscle.

In some cases these wounds had healed practically by first intention, but there was often a considerable reaction, which might last for several days, the temperature being raised to 101° or higher, and the wound discharging a quantity of exudate, which was sometimes thin and watery, and sometimes frankly purulent. In one or two instances severe suppuration had occurred, but the wounds had nevertheless eventually healed soundly.

The advantage of the muscle graft over the method of Broca was that less bone need be removed, and it was not necessary to convert the whole cavity into an open gutter. Hence the bone need not be weakened to the same extent. (Broca spoke of fractures having occurred during his operation.) Further, the cavity often extended into the articular end of a bone, in which case it could not be converted into an open trough in its whole extent. The obliteration of the cavity by the falling in, or pressing in, of the overlying soft parts might take some time, and might fail to be complete; by means of muscle grafting we got an immediate and entire filling up of the space. In contrast with the other materials which had been used, we had in muscle a living vascular tissue, which might be presumed to furnish cells and fluids capable of completing the removal of such micro-organisms as might remain.

It was possible that, in parts at least, union between the raw bone and raw muscle might occur by first intention, or the bone and muscle might each become covered with granulations which would subsequently unite. In either

case the respective blood vessels of bone and muscle coalesced, so that an additional supply of blood was brought to the bone.

The fate of the graft, however, was a matter of subsidiary importance; for if the procedure had successfully obliterated the cavity, its real object had been attained, namely, sound and final healing. Whether ossification would ultimately take place was immaterial from the point of view of strength, for, as the patient used the limb, and so subjected the bone to strains and stresses, compensatory overgrowth occurred. This was well exemplified in a radiogram taken by Captain Keen.

Captain B. S. SIMMONDS spoke of the work he had carried out with Colonel Sargent and Major Shields at Tooting Military Hospital in dealing with gunshot fractures which were unhealed owing to the presence of septic tunnels and cavities in bone. Their object had been in all cases (1) to expose freely by periosteal resection the whole area of the injury to the bone; (2) to open up thoroughly the cavity or tunnel so that its whole extent could be explored; (3) to remove all sequestrum and diseased bone, and the fibrous tissue and granulations lining the cavity or tunnel; and (4) to arrange for soft parts to fill the cleaned cavity completely. He thought that every case should be treated on its merits without one method exclusively being adopted. Many cases of tunnel and cavity which could, without removal of too much bone, be converted into a shallow cavity could be cured by Broca's method, but other cases, such as cavities involving the condyle of the femur, and cavities in which removal of sufficient bone would endanger the function of the limb, were best treated by the muscle graft.

Captain Z. MENNELL said that during the past year he had performed the operation in about twenty-seven cases, twenty-three of which could be traced. He wished to emphasize certain points:

1. The need for complete excision of the sinus leading to the bone cavity, and of the surrounding scar tissue. It was essential that the incision should run through healthy skin, so that the stitches need not pass through scar tissue or sustain any tension.

2. The careful packing off of the wound, so as to avoid bone chips being overlooked.

3. The muscle tissue used as a graft must be muscle tissue only, without tendon or fascia attached to the surface which comes into contact with the raw bone surface. The graft must have a good blood supply, and be free at one end.

4. Efficient drainage of the cavity from which the muscle has been taken, through a separate wound in the most dependent position possible.

5. The need for firm pressure over the muscle in the cavity when the dressing is applied.

6. Careful examination of each case for any interference of the blood supply to the limb.

Referring to the after-effects, he said that there was very considerable oozing. This need not cause alarm, and only necessitated packing the wound outside the original dressing, and perhaps a firm bandage in addition. There was often considerable reaction, and sometimes, in addition to constitutional symptoms such as fever, an apparent severe local infection. This only lasted a short time, and if there was sufficient drainage no ill effects appeared.

Major J. R. LEE read a paper on compound fractures of the femur in its upper third, and demonstrated his new pelvic-femur splint, and also a splint for fractures of the upper extremity.

RADIOGRAPHY OF THE APPENDIX.

AT a combined meeting of the sections of Electro-Therapeutics, Clinical Medicine, and Surgery of the Royal Society of Medicine, held on November 15th, Dr. EDMUND SPRIGGS read a paper on the examination of the vermiform appendix by x rays, with photographs and drawings by Mr. O. A. Marxer, Radiographer to Duff House. After a summary of the literature of appendix radiography, in which our indebtedness to American workers was acknowledged, the authors described the methods which they had found of value. The patient was prepared with castor oil and given a meal, similar to that recommended by George and Gerber,[1] consisting of three-quarters of a pint of buttermilk and 150 grams or less of barium sulphate. Careful screening with suitable manipulation was needed to observe the mobility of the appendix and the presence or absence of active movements or of tenderness. Photographs must also be taken freely, as the chief points which helped to decide whether the appendix was healthy or diseased—namely, the filling and emptying of the appendix, its position, and its outline—were observed best on the photographic plates. The manipulations which had been found most useful were detailed.

The following figures were given by the authors: The first hundred cases in which they observed the passage of an opaque meal through the alimentary canal were left out of account, as the ileo-caecal region was not examined with such care as is now given it. Of the next two hundred cases, with a standard meal in which castor oil was also used in many instances, the appendix was seen clearly in a few. They then began to use the barium and buttermilk meal after preparation by castor oil. In the fourth hundred cases the appendix was seen twenty-four times; in the fifth hundred thirty-five times; then fifty-four times; then seventy-two times; and in the eighth and last hundred eighty-six times.

After an account of the radiography of the normal appendix the examination of cases of appendicitis was described. In acute appendicitis the patient was not usually fit to be x rayed; neither was such a method of diagnosis needed. In chronic appendicitis the authors had found x-ray examination of great value, especially in the subjects of vague abdominal symptoms of unknown cause. In 36 cases a diagnosis of chronic appendicitis had been made and confirmed by operation. The chief points to which attention must be paid were: (1) The filling and emptying of the appendix; delay. (2) Shape; constriction and dilatation. (3) Faecal concretions; vacuoles. (4) Mobility. (5) Hyperactivity; spasm. (6) Tenderness. (7) Position. The signs of present inflammation were, in addition to pain and other clinical symptoms, a tender point (though tenderness required care in its interpretation) and varying dilatation of the lumen from hyperactivity and spasm; whilst evidence of former disease, recent or remote, was given by concretions, abnormal outline, delay in filling or emptying, adhesions, severe kinks, and, in certain cases at least, by the absence of a shadow. The proportion of cases in which no barium sulphate entered the appendix was small when the methods described were used; but the authors did not think it justifiable in the present state of our knowledge to assume that an appendix was abnormal because it did not fill, though they would regard it with suspicion, especially if the observation were repeated.

The paper was founded on the study of the photographs of some 300 appendices.

[1] *Surg., Gynec., and Obstet.*, 1913, xvii, 418.

INTERDEPENDENCE OF THE SYMPATHETIC AND CENTRAL NERVOUS SYSTEMS.

AT a meeting of the Medico-Psychological Association of Great Britain and Ireland, on November 26th, when the ex-President, Lieut.-Colonel D. G. THOMSON, was in the chair, Dr. DAVID ORR and Lieut.-Colonel R. G. ROWS submitted a contribution with many illustrations on this subject. In the class of cord lesions which formed the subject of their previous work insuperable difficulties were encountered in accepting a "general intoxication" theory without qualification. It was to be presumed that the poison concerned did not act unaided or indiscriminately, and there were reasons for surmising that the sympathetic nervous system was, in all likelihood, the intermediary in determining the localization of the lesions. Evidence in support of this view was now brought forward. The authors insisted on the importance of remembering that sympathetic action was dependent upon the supply of adrenalin. The sympathetic nervous system, the adrenal bodies, and all chromaffin tissue must be considered as one in relation to the blood vascular system; chromaffin tissues yielded adrenalin or a similar chemical substance, and almost all the effects produced by this were akin to those produced by the sympathetic system. The sympathetic system was intimately linked up with the central nervous system; it had no true autonomy, and there were anatomical paths which provided for a constant interaction between them. Stimuli must be constantly passing from the sympathetic to the central nervous system, as there were special sense organs in the viscera and a definite

sensory afferent path, and they certainly exercised physiological effects. The authors set out the plea of von Monakow for the material basis of the sentiments and emotions, and said, in conclusion, that it was apparent that in nervous diseases, especially in those affecting the cerebrum, it was necessary to study, in the future, not only the more prominent symptoms dependent upon disturbed function of the central organ, but also the collateral symptoms arising from disturbance of all the peripheral organs intimately connected with it. The problem could not be solved by a narrower programme.

Reviews.

WOUNDS OF THE LUNG IN WAR.

PIERRE DUVAL'S monograph, *Les plaies de guerre de poumon*, was reviewed in our issue of September 29th, 1917. The English translation of this book,[1] carried out by the medical officers of No. 36 Casualty Clearing Station, who were for several months working in the same building with Duval, will be welcomed by many to whom the application of surgical treatment to the gunshot wound of the chest has been one of the striking features of war surgery. The name of Duval will always rank high as one of the pioneers of this work in the French armies, and this early work was quickly followed in our own armies, notably by Gask, Gray, Lockwood and Nixon, and J. Anderson.

The mortality of the chest wound has always been high, and where a fatal termination has been avoided prolonged disability has often ensued. It was contemplation of these facts that induced Duval to advocate more systematic operating in such cases. One of the most encouraging results he has achieved has been the reduction of sepsis, which is responsible for more than a quarter of the total mortality. Another class of case which was in pre-operative days almost always fatal—the open pneumothorax or the sucking wound—has by surgical intervention been removed from the category "hopeless," and in many cases has been saved. The danger of leaving fractured ribs—more especially comminuted fragments driven into the lung—has been pointed out, for probably this is one of the commonest causes of subsequent infection. The control of pulmonary haemorrhage, the suture of lacerated lung tissue, the cleansing of the thoracic cavity and removal of clot, are all procedures advocated in the book, with the object of saving life threatened by haemorrhage, of diminishing risk of infection, and of securing a more rapid expansion of the lung and return to normal conditions.

The method of operating is dealt with fully, and some of the earlier results are recorded. Since the book was published the author has recorded in detail the results of his treatment, and these will, it is to be hoped, be included in later editions. Successful treatment does not depend on the surgeon alone, and in his introduction Duval pays tribute to his colleagues—physician, bacteriologist and radiographer—who formed with him a "team" which studied the problem of the chest wound, and to whose concerted labours much of the success was due.

The appearance of the English translation prompts us to make one criticism of Duval's book: a clearer definition of the types of case needing operation might well have been included. It is possible to obtain the impression, in reading it as it stands, that every case needs operation, whereas in practice Duval has operated on only a small proportion of the total admissions, probably not more than one in four. Apart from its value as a war record, the book will repay study in that it is suggestive of methods which are applicable to civil practice; and the fact that in the hands of the skilled surgeon the chest can be opened with comparative impunity and damaged lung dealt with, may mean some extension of thoracic surgery to diseased conditions in the future.

NOTES ON BOOKS.

THE seventy-fifth annual issue of the *Medical Directory*, for 1919, has just been published.[2] It contains the information which has made it so useful to the medical profession for many years past. The total number of names is 43,100, which shows an increase of 69 as compared with the last issue, and of 1,128 since 1914; as compared with ten years ago the increase is 3,195. The number of names in the London part of the *Directory* is 30 more than in 1917, but in the rest of England there is a decline of 119. Scotland, Ireland, and Wales show increases of 96, 57, and 3 respectively. The number of medical practitioners accredited to the Naval, Military, and Indian Medical Services is now 3,162, which is 21 more than last year; but it has to be remembered that the Services section is confined to Regular medical officers. The names of all temporary surgeons in the Navy and of R.N.V.R. surgeons, together with those of medical officers of the Special Reserve, and Territorial Force, and of those holding temporary commissions in the R.A.M.C., are quite properly given under their home addresses throughout the other sections. It is therefore impossible to obtain any idea from the *Directory* of the number of civilian practitioners now actually in practice at the addresses given, or of the number of those serving temporarily with the forces. The customary list of honours, which in consequence of the war had been growing longer and longer each year, has now been cut down to a list of titles conferred upon members of the medical profession. In other respects the new *Medical Directory* shows little change from the issues of recent times, and it remains an indispensable work of reference for all concerned with medical administration.

The twenty-ninth annual issue of *Burdett's Hospitals and Charities*[3] has now made its appearance, and will be welcomed by all who are accustomed to consult it on matters relating to hospitals and other philanthropic institutions. The opening chapters give the usual comprehensive summary of recent hospital progress, but the chapter on hospital construction has been omitted, as, owing to the war, there is little fresh to record in the way of new buildings. The chapter and tables relating to hospitals in the United States, Canada, Australasia, and India, together with the sections in the directory dealing therewith, have also been omitted, but for another reason—the schedules were on board the *Andania* when she was torpedoed, and there was no time for the issue and return of fresh proofs before this edition went to press. In his survey of the past year the editor refers to the shortage of hospital beds for the civilian population due to the provision of accommodation for military patients. Even before the war the number of beds was inadequate, as the long waiting lists showed. Upon this Sir Henry Burdett writes: "The shortage becomes a scandal when there is a hospital in every other street, and when a bed is automatically found for any number of patients so long, but only so long, as they are in the army. . . . When war was declared the voluntary hospitals not only possessed no real margin of reserve to meet the immediate claims of the soldiers, but far too few beds for the needs of peace." He is optimistic enough to believe, however, that the number of hospital beds which the country has supported during the war will never be allowed to drop to the pre-war level. Nor has he any doubt of the permanent vitality of the voluntary principle, which he regards as the outstanding fact amidst all the changes and vicissitudes of the last four and a half years. Including the additional beds allotted to soldiers and sailors, voluntary effort in the United Kingdom has provided 134 hospital beds for each hundred thousand inhabitants.

The article on *A Vision of State Medical Service*,[4] by Colonel G. T. K. Maurice, C.M.G., R.A.M.C., which appeared in the issues of the *Hospital* for November 9th and 16th, has been published in a pamphlet. We referred to Colonel Maurice's views at length in the JOURNAL of November 23rd, p. 579, and in the JOURNAL of the following week published a letter from Colonel Maurice stating that we had misunderstood him in supposing that he advocated a State medical service. "I have only," he said, "suggested a possible organization for a State medical service if the peoples of Great Britain decide they wish to have a State medical service."

AT the last meeting of the Congress of Italian Medicine it was resolved that the next meeting should, "if possible," be held at Trieste. The Italian profession is rejoicing that this possibility will now be realized.

[1] *War Wounds of the Lung.* Notes on their Surgical Treatment at the Front. By Pierre Duval. (English translation.) John Wright and Sons. (Pp. 100; 27 plates and illustrations. 8s. 6d.)

[2] *The Medical Directory.* 1919. Seventy-fifth annual issue. London: J. and A. Churchill. 1919. (24s. net.)

[3] *Burdett's Hospitals and Charities*, 1918. By Sir Henry Burdett, K.C.B., K.C.V.O. Twenty-ninth year. London: The Scientific Press, Limited. 1918. (Cr. 8vo, pp. 872. 12s. 6d. net.)

[4] London: The Scientific Press, Ltd. (1s. net.)

MEDICAL AND SURGICAL APPLIANCES.

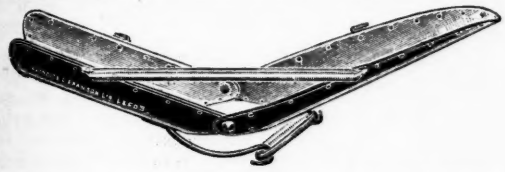
An Arthrometer.

DR. R. FORTESCUE FOX writes: The illustration depicts a new device for measuring the angles of movements of joints, which has been designed by Mr. Wilbraham Falconer, superintendent of mechanical treatment in the Red Cross clinic for the physical treatment of disabled officers. This "arthrometer" is simple in construction and easily adjusted to the limbs, and the measurements

are quickly taken. It is intended to be used with all joints, and therein differs from the various forms of protractors and goniometers at present in use. If properly adjusted to the limb the readings cannot be otherwise than accurate. The apparatus is manufactured by Allen and Hanburys, Limited, 48, Wigmore Street, London, W.1.

A Splint for Dislocation and Fracture of the Elbow.

Dr. J. C. R. HUSBAND (Ripon) sends a description of a splint he devised some years ago to prevent stiffening of the elbow-joint after dislocation accompanied, as it frequently is, especially in the case of children, with fracture. It is made of tin, perforated round the edge with holes for padding, and is light and strong. It should be applied to the outer side of the arm, bent at the angle most comfortable to the patient. If the limb is in the flexed position elastic bands are then attached to the



hooks directly behind the elbow-joint, and when the continuous contraction of these, acting for some hours, has gradually straightened out the limb, the bands should be changed to the hooks on each side of the front of the splint; when acting on the other side of the limb they bring it back to a fully flexed position. In this way slight, continuous, and prolonged pressure can be applied. The axis of the hinge is the same as that of the joint, and when the limb moves in extension and flexion it does not alter its position on the splint; the elastic bands can be changed by the nurse or even the patient as often as thought desirable without readjustment. The force employed is easily regulated by the number and size of the elastic bands. The splint is made by Messrs. Reynolds and Branson, Leeds.

THE fourth National (American) Exposition of Chemical Industries, which was held at New York in the last week of September, showed how largely America has within a few years freed itself from the domination of German chemistry, and what has been accomplished in capturing the chemical, glass, and dye industries from Germany. The fifth exposition will be held at Chicago in September, 1919.

BOECKEL (*Med. Klinik*, 1918, xiv, 860–1) thinks that a tender spot in the lumbar region is pathognomonic of influenza. A horizontal line is drawn two fingerbreadths above the highest points of the iliac crests with the patient in the vertical position. The point where this line intersects the outer border of the longissimus dorsi is the tender point characteristic of influenza, and corresponds, according to Boeckel, to the junction of the third and fourth lumbar vertebrae. It is often the only objective sign at the beginning of the disease, and sometimes persists after all the other manifestations have disappeared. During the last six years he has never found it in any other disease, and considers that its constant presence in influenza on one or both sides proves that there is usually in this disease more or less marked neuritis affecting all the branches of the lumbar segment, especially the fourth lumbar nerve. This hypothesis explains the pain in the back and legs, and also accounts for the giving way of the knees in severe attacks, as the fourth lumbar nerve sends motor fibres to the quadriceps extensor muscle, and is the sensory nerve of the inner side of the leg.

THE SCHOOL MEDICAL SERVICE.

THE annual report for 1917 of the chief medical officer of the Board of Education[1] contains many interesting observations which are of particular importance at the present time. The School Medical Service was established ten years ago as a national institution under the general direction of the Board of Education. In common with almost all other national institutions it has had to contend with many difficulties during the past four years; but there is this compensating feature, that the war "has brought home to every one the imperative necessity of using every means not merely to diminish the ordinary wastage of infant life, but also to make and keep the rising generation sound in body and mind."

Effects of the War.

As was only to be expected, the war has seriously disturbed the machinery of the School Medical Service—so much so that in some areas the work has been maintained with great difficulty and not always with complete success. There has also been considerable anxiety lest war conditions should have a harmful effect on the health of the children. School medical officers throughout the country were apprehensive that the children of the working classes might be injuriously affected by such social influences as food rationing, the high price of food, the diminution of parental control, daylight saving, and air raids. It is satisfactory to learn that in spite of all the untoward circumstances of recent times the children in the elementary schools are generally in a better nourished condition than they were before the war. Uncleanliness, however, has increased, and this is ascribed in part to the lessening of supervision by parents, and in part to the introduction of infection from returning troops. Fears with regard to the harmful influence of air raids upon the nervous system of children have, fortunately, proved to be groundless. In 1916 there were many complaints that the Daylight Saving Act was having an ill effect on children by depriving them of an hour of sleep daily; but in the second year of "summer time" practically nothing was heard on the subject, though it is probably still true that many parents keep their children up longer than is good for them.

The Education Act, 1918.

A short section of the report is devoted to medical arrangements under the new Education Act, and a summary is given of the provisions of this Act in so far as they relate directly to the School Medical Service. Though some time must elapse before many of the provisions can be brought into active operation, local education authorities are reminded that it is their duty to consider at once the problems involved and the steps that must be taken to fulfil the purposes of the Act. The new Act emphasizes the point, which has always been insisted upon by the chief medical officer, that the true objects of the School Medical Service are not the detection of defects and the discovery and treatment of child patients, but the improvement of the health and physical development of the whole child population of school age. In the present report Sir George Newman deprecates once more the narrow "bottle of medicine" conception which would restrict the work of the School Medical Service to sick children. What is required, he says, is a broad, carefully considered and unified system for the care and development of all children of school age; and this must be based on a full and complete system of medical inspection and diagnosis. The new Education Act recognizes that no single uniform plan will meet the needs of every area. Accordingly the responsibility for considering the kind of scheme best suited to local conditions is placed in the first instance upon each local education authority, and not upon the Board of Education.

A Model Inspection in Town and Country.

Section 3 of the report contains an interesting and instructive account of an inquiry into the physical condition of unselected samples of town and country children of school age, undertaken by Dr. C. J. Thomas, assisted by Dr. Norman. The object of this "model inspection" was to check the results of previous examinations conducted

[1] Cd. 9205. H.M. Stationery Office. 1918. To be obtained through any bookseller. (1s. net.)

during the past ten years by a large number of medical officers of varying competence and experience and working to different standards. On the whole, the findings are in accordance with former observations, both as to the proportion and the severity of the defects discovered. But the circumstances of this inquiry afforded an unusual opportunity of comparing the physique of town and country children. The general impression left upon the mind of these two expert observers was that the country children seemed rosier, healthier, and superior in general carriage, while defects of vision and hearing were less common among them. On the other hand, the condition of their teeth was worse to a great and surprising degree. The state of nutrition showed little difference. The country children, while notably freer from septic conditions of the skin, eyes, and ears, were considerably more prone to mouth breathing and the dullness of expression associated with adenoids and enlarged tonsils. As one would suppose, anaemia was much more prevalent among town than country children, as were also curvature of the spine and flat-foot; but, curiously enough, enlargement of the thyroid gland was far commoner in the country children, especially among the girls. Many of the children examined were much behind in their studies, and investigation of the circumstances forced the examiners to the conclusion that physical defect is one of the chief causes of backwardness in school.

Commenting upon the results of this intensive inquiry, Sir George Newman writes: "No one, I think, can consider these findings, or read Dr. Thomas's account of the physical condition of these children about to leave school for industrial occupation, without understanding, once and for all, the gravity of the situation. . . . It seems futile to attempt to reform education apart from the physical condition of the child; it seems unreasonable to expect healthy adolescence and healthy citizenship if we continue to neglect the remedy of the physical disabilities of childhood and the prevention of their cause." Further on, in the section on the medical treatment of the school child, we read that from 20 to 30 per cent. of the children inspected on a routine basis required treatment, which lends force to the general proposition laid down by Sir George Newman, that a State cannot effectually insure itself against physical disease unless it begins with its children. This, indeed, is the keynote of the whole report.

School Dental Work.

The dental condition of the school children throughout England and Wales remains very serious. It is estimated that of the six million children on the registers of elementary schools not less than half are in need of dental treatment, and for many this need is urgent. The Board has advised that dental inspection should be carried out only by qualified dentists, and preferably by those who undertake subsequent treatment. Admirable advice; but where are the qualified dentists to attend to the carious teeth of three million elementary school children? It is recommended, further, that the inspection of the children's teeth should, as a rule, take place on the school premises and in school hours. The amount of dental work among children is so great that the scope of school dentistry has usually to be restricted at present to certain age groups, more especially the group of children from six to eight years of age—that is to say, the period of eruption of the permanent teeth. The reports of the school medical officers for those areas in which dental schemes are in operation all testify to the excellence and great value of the work undertaken by the school dentists. There are now upwards of 300 dental clinics, with a staff of 239 school dentists; but more than half of the local education authorities in England and Wales have as yet made no arrangements whatsoever for the dental care of the children under their charge. Obviously there is much room for further effort, for the findings of medical and dental inspection in schools have demonstrated an overwhelming case for the organized dental treatment of school children.

Special Schools.

A substantial part of the medical treatment of a certain group of defective children—blind, deaf, feeble-minded, epileptic, and tuberculous—takes the form of a special kind of education which is undertaken in the "special schools." It would appear that accommodation has been provided at present for less than half the children affected. Much remains to be done for these children, but perhaps the most pressing need is a careful and systematic survey of all the physically defective children in each area. With regard to the tuberculous child the reports of the school medical officers indicate that much attention was given by them to this subject in 1917, but, generally speaking, the problem of tuberculosis among school children has been somewhat neglected during the war. In this connexion it is worthy of note that the provision made by local education authorities for the teaching of children under open-air conditions has lagged far behind the recommendations of the school medical officers. "It is to be feared that only too commonly the war is being made an excuse for inaction in this matter, and by some authorities that did little or nothing before the war."

An interesting section is devoted to the problem of the mentally subnormal child. Much valuable experience has already been gained in the special schools with regard to the educational requirements of dull, backward, and feeble-minded children for whom the ordinary classroom is quite unsuited. Of the various forms of educational hand-work, gardening would seem to be the most valuable in its effect upon physical and mental development. More than this, "in a peculiar way it exerts a moral influence recognized by all teachers of defective children." Hence no special school can be considered complete without ample provision for a school garden.

Health and Education.

Physical education, the provision of school meals, and the control of juvenile employment, are dealt with in separate sections of the report. There appear to be signs that educationalists are at last coming round to Sir George Newman's view that a comprehensive scheme of physical training should be one of the essential elements of education. The effect of industrial employment upon the physical and educational well-being of the child worker is a matter of profound national importance, and its significance has been much increased by the war, which created a new and almost universal demand for child labour. Efforts have been made to safeguard the welfare of the children so employed, but here again much has been left undone by the more backward local education authorities. Sir George Newman's conclusions on juvenile employment are worthy of the closest study.

The last section gives a review in outline of the first ten years' work of the School Medical Service and of its organization. While the system is as yet neither complete nor adequate, it has already begun to exercise a powerful influence on the educational system of the country, and this should bear more and more fruit as time goes on. One effect of the School Medical Service has been to secure fuller recognition of the principle that a true education must be individual, and that no child can be educated wisely or well without regard to its physical and mental health. Further, the School Medical Service has already succeeded in bringing to light the prevalent defects and diseases which are undermining the physique of the child. Most of these, if taken in time, are preventable. The nature and extent of the evil have been determined, but it remains to apply the remedy.

WOLBACH and MORSE report (*Amer. Journ. Dis. Children*, 1918, xvi, 63) three cases, one in considerable detail, of neuroblastoma sympatheticum, a rarely recognized tumour. From a review of the literature they bring the number of recorded cases up to 29, of which 20 were primary in the adrenals, 3 in the retroperitoneal tissues, 3 in the sympathetic ganglia, and one each in the coccygeal gland, the nose, and the uterus. It is, however, highly probable that many other cases of primary tumours of the medulla of the adrenals reported as sarcoma were really neuroblastomas. As in so many other instances, Virchow long ago described this form of tumour, and recognized the nervous nature of an adrenal tumour, and compared the cells with the neuroblasts of the fetal sympathetic. The diagnosis of these tumours turns on the presence of delicate protoplasmic fibrils representing axis cylinder processes. They have been variously labelled as neurocytoma, ganglioma embryonale sympatheticum, and neuroblastoma sympatheticum. Of the 29 cases reported there has been but one survival, Lehman's case in an infant successfully operated upon.

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SATURDAY, DECEMBER 14TH, 1918.

MEDICAL DEMOBILIZATION.

DURING the past two months we have referred several times to the problem of medical demobilization, which long before November 11th had occupied an increasing share of the attention of the central professional committees. A scheme, originally drafted more than a year ago, for the demobilization of medical officers serving temporarily with the forces has now been revised from beginning to end, with a view to securing the utmost degree of simplicity and elasticity, and of fairness to individuals in very varied circumstances.

After the order of release had been sketched out evidence was received tending to show that the earliest withdrawals ought to be governed by the needs of those civilian areas which have suffered most from the shortage of doctors and are in danger of a breakdown of the medical service through the added strain of the epidemic of influenza. Apart from the urgent need of certain civilian localities, it is rightly held that the personal claims of the men on service should be the primary consideration in drafting a scheme of priority. The main task throughout has been to avoid a multiplicity of groupings. It is plain that in an intelligible smooth-working scheme the primary groups must be few in number, readily distinguishable, and wide enough to include all serving medical officers. Further, it must secure preferential treatment for those who have given up most, those who have served longest, and those whose terms of service have been hardest. Upon this principle Territorial, Special Reserve, and R.N.V.R. medical officers who were called up from private practice at the beginning of the war would naturally be released first of all. The position of temporary medical officers who volunteered, and they are not few, is similar.

Speaking generally, the chief consideration will be length of service, and after this the nature of the man's practice and the weight of his family responsibilities. Age also is an important factor, and it is proposed that a distinction should be made on this ground, the dividing line being, say, attainment of the age of 30 at the time of the armistice. These, in broad outline, are the principles underlying the scheme, but every medical officer will be given an opportunity to submit his claim to early or special treatment for consideration by the appropriate professional committee. The amended scheme has now been forwarded to the Ministry of National Service, and, when approved, will no doubt be made public at the earliest possible date. The Central Medical War Committee has given long and anxious consideration to this matter, and we are glad to record that two of its members have lately joined the Interdepartmental Committee on the medical services, whose chief duties will be in connexion with professional demobilization.

The position at the moment would thus appear to be that a limited number of medical officers are being released from the army in order to provide enough civilian medical men to prevent a breakdown in depleted areas, or repair a breakdown where this has already occurred. The demand is regarded as so urgent that where either of two medical men serving abroad would fill a gap equally well, the one who can be brought home the soonest is taken. It is obvious that such priority will give some men an advantage to which they are not entitled on personal grounds, but the number of men so released, in order to cope with the present epidemic, is likely to be very small compared with the large numbers who must await the orderly plan of demobilization. In each case the application for immediate release is made in the first instance by the Local Medical War Committee of the area concerned, and the recommendations are passed on to the authorities by the central professional committee after assessment of the claims and circumstances of all the localities.

Apart from these emergency withdrawals it seems doubtful when medical demobilization will really begin. The surgical needs of the army have abated considerably since the date of the armistice, but, as appears from the article we print at page 666, this is not yet the case with the British armies moving from France into Germany; and the demand from the forces in Palestine, Egypt, and Mesopotamia can only diminish slowly, while there may be much delay in procuring the return of the many Territorial and temporary medical officers in India. Past experience, however, suggests that the military authorities will hold on to all the medical officers they can for as long as they can. The Ministry of National Service is now entering upon the stage of dissolution, but it is still the intermediary between the civil medical profession (represented by the central professional committees) on the one hand, and the War Office, the Admiralty, and the Air Ministry on the other. We rather fear that unless the professional committees make themselves unpleasant at frequent intervals, the scheme for medical demobilization upon which so much care has been spent may become a shuttlecock amongst the various Government departments, whilst hundreds of medical officers, badly needed at home and anxious to get back, remain in comparative idleness abroad.

So far we have spoken only of the process of medical demobilization—that is to say, the disbanding of military and naval medical officers during the reduction of the armed forces to a peace footing. But, apart from the order in which release is to be carried out, other questions of a more directly professional kind are bound to arise in connexion with the return of doctors from the services to civil life, and this matter also is engaging the close attention of the Central Medical War Committee. It is beyond question that the home-coming of many medical officers who have served several years abroad will be fraught with many difficulties, both financial and professional. These difficulties will vary according to whether the medical man was previously in practice or whether his civilian career lies all before him, and in the former case they will depend upon the kind of practice in which he was engaged. No two cases can be quite alike, but the man who has a whole-time appointment awaiting his return and the man whose interests have been safeguarded by an active partner clearly belong to a class which may need little or no assistance. On the other hand, many single-handed general practitioners serving abroad may be looking forward with dread to beginning life all over again as the result of their prolonged absence; there must be many consultants and specialists in like case. Letters which we have received from serving medical officers indicate widespread apprehension as to their position and prospects on returning to civilian life. Naturally, those who have been longest away feel the greatest uneasiness; some, indeed, write in a

spirit of utter pessimism. Every generous man will sympathize with those who gave up everything to risk their lives for their country, and now ask with some bitterness how they are to begin life again upon the ruins of their former practices. Nevertheless, although the situation is difficult and obscure at the moment, it would, we feel sure, be doing a great disservice to these medical officers to encourage them in thinking that the outlook is necessarily black. Nor would it be right to agree offhand with those of our correspondents who attribute the apparent loss of their practices to the negligence, or worse, of the colleagues who have remained at home. Here and there this accusation may be only too well founded, but we refuse to believe it of the general body of our profession. The goodwill of a private practice is notoriously elusive, and the utmost loyalty of his colleagues may not avail to keep together a doctor's *clientèle* during four or five years' absence. But, even so, the experience of men who have resumed civil work during the course of the war suggests that within a short time of his return the home-coming doctor may find his practice beginning to rise again out of its own ashes. Indeed, all the indications tend to show that the country can absorb a great many doctors, the normal additions to the civil profession having been cut down for nearly five years, and the losses from death and retirement not yet made good.

The whole situation, as we have said, is being carefully studied by the central professional committees, which are anxious to assist in every possible way those who have served their country to re-establish themselves in practice. Responsibility is also felt towards the junior members of the profession who have never been in civilian practice and will need guidance on release from the forces. We have some reason to think that this is understood by the War Office authorities. The committees regard it as a duty and a privilege to do whatever they can to protect the interests and promote the welfare of all doctors who leave the forces. We are glad to know that the Central Medical War Committee is arranging for a conference to discuss this matter with representatives of the Military Service (Civil Liabilities) Department, the Professional Classes War Relief Council, the Officers' Families Fund, the War Emergency Fund of the Royal Medical Benevolent Fund, the National Relief Fund, and the Committee of Reference.

SHOCK AND ACIDOSIS.

WE have on several previous occasions had the opportunity of referring to the work of the special Investigation Committee on Surgical Shock of the Medical Research Committee. Another report has now been issued, dealing with the relation of acidosis to the symptoms of shock. It is of the greater value because it expresses the conclusions reached by a committee of physiologists and surgeons after a great deal of many-sided experimental work as to the relation of acidosis to shock, and as to the nature of shock. There has been during the past year or two so much discussion, and so many divergent views have been strongly expressed, that the coming together of the chief workers in the conclusions now given by unanimous agreement in this report has special interest.

The position of the subject when it was taken up by the Committee was obscure. There were two main currents of opinion, of which one attached chief importance to the term "acidosis," used to denote a reduction of the alkali reserve, or, more simply stated, of the sodium bicarbonate of the blood plasma. Cannon, from observations made at a casualty clearing station in France by van Slyke's method, had found that there was a notable deficiency of alkali reserve in the blood of patients suffering from shock, and that its extent showed a general correspondence with the severity of the condition, so that it could be used as an index to the fitness of the subject for operation.

The investigations of the Committee now reported were directed to ascertain the true significance of this acidosis, the existence of which in shock was beyond question. It was common ground that defective circulation would cause acidosis, and one type of defect—that due to haemorrhage—had been shown by Milroy to have that result. But beyond this the Committee was confronted with the two alternative opinions: the first was that primary acidosis resulted in some way from the trauma, and that it developed in advance of, and had at least an important share in, the causation of the circulatory failure. On this head there was some evidence indicating that lactic acid, evolved by injured and moribund muscle as it passed into rigor mortis, was the cause of this acidosis. Those who abided by this first alternative recognized that a secondary acidosis would develop from the consequent failure of the circulation, but they maintained that the initial disturbance of the equilibrium starting the train of symptoms was attributable to primary acidosis caused by the trauma. Those who held to the other alternative did not concede the central importance of a mere reduction of the alkali reserve in the blood, which they regarded as a symptom and a measure of the defective oxidation due to the sluggish flow of blood through the capillaries. They refused to admit that there was any evidence that acidosis of the degree recorded in the cases was in itself harmful, or, indeed, that a much more extreme depletion of the alkali reserve would initiate a failure of the circulation of the type under discussion. They maintained, therefore, that the cause of this circulatory defect must be sought elsewhere.

This difference of opinion was not of mere theoretical interest; it involved practical questions of treatment. Were acidosis the primary event, and failure of the circulation secondary, the obvious treatment for shock would be to restore the alkali reserve in the blood by giving sodium bicarbonate, and it might even be hoped to prevent shock by giving bicarbonate to the wounded before shock had had time to develop. On this view restoration of the volume and rate of the circulation by other means would be merely palliative and symptomatic treatment, for unless the alkali reserve were directly restored the root of the mischief would remain. On the other hand, were the acidosis merely a consequence of the weakened circulation, as was held by the opponents of this view, injection of bicarbonate solutions would have little, if any, more value than that of equivalent injections of neutral saline. Radical relief could only be expected from measures which restored to the blood its normal value and rate of circulation. If this could be effected by transfusion of blood or infusion of some efficient substitute such as a solution of gum in saline, renewal of efficient oxidation in the tissues would ensure the disappearance of the acidosis.

Experimental observations on animals led at first to contradictory results, but eventually the two groups of observers combined in a test from which the possible complicating factors were eliminated; the result was the unanimous conclusion that acidosis

does not by itself cause shock or any comparable impairment of the circulation. The experiments were mainly directed to the condition of the circulation; the central feature of the form of shock specially investigated was progressive deficiency of the circulation, due to inadequate venous return to the heart with consequent slowing and partial stagnation at the periphery.

The Committee's conclusion, therefore, is negative; but it is nevertheless of great practical importance, inasmuch as it excludes the hypothesis that shock is caused by acidosis. The parts played in its genesis by nervous, chemical, or other influences are left for further investigation. It is recognized, moreover, that possibly several different conditions may be included in the rather vague use of the term "shock" now prevalent, and that in some of these the central feature may be depression of vital functions other than that of the circulation.

The whole effect of the evidence obtained in the investigation has been to emphasize the cardinal importance of maintaining an adequate oxygen supply to the tissues and to show that the most potent agent in rendering the supply inadequate is defective circulation through the capillaries. The practical conclusion, therefore, is that restoration of the volume of blood in effective circulation is the object to be aimed at, for then acidosis will disappear naturally. Transfusion of whole blood is said to be probably the measure most likely to be successful in procuring this restoration in the largest proportion of cases, provided it is applied without undue delay. When, however, delay has unavoidably occurred it is to be remembered that low blood pressure and retarded capillary circulation are much more harmful than a reduced oxygen-carrying power of efficiently circulating blood. In a large proportion of cases infusion of gum saline solution will be almost as effective as transfusion of blood, and in a further proportion it will be effective in deferring the appearance of the secondary results of impaired oxidation in the tissues, so that transfusion of blood, if it later becomes necessary, can be undertaken with a greater prospect of success. The fluid recommended for infusion is a filtered and sterilized solution of 6 per cent. gum acacia in 0.9 per cent. sodium chloride. It is now being prepared in bulk at a base hygiene laboratory. If symptoms such as "air hunger" appear to indicate that acidosis has become a source of danger, sodium carbonate may be given separately by the mouth or rectum, or, if necessary, by cautious intravenous injection of a 2 per cent. solution, which is approximately isotonic.

VITAMINES.

We announced a short time ago that the Royal Society had allotted one of the Royal Medals to Dr. F. Gowland Hopkins, F.R.S., Professor of Biochemistry in the University of Cambridge. The terms of the award give so succinct an account of Professor Hopkins's work in regard to the accessory factors in diet that we reproduce the text, for which we are indebted to *Nature*: "Professor Hopkins was among the very earliest, if not actually the earliest, to recognize and announce that minute quantities of certain bodies, the nutritive value of which had hitherto been unsuspected, exert an enormous influence upon growth and upon normal adult nutrition. He showed that without these accessory factors—vitamines—a diet otherwise full and seemingly complete is incapable of allowing growth, and even of maintaining body weight or life. He has also made important researches into what may be styled the determination of the specific nutritive values of individual main components of the protein molecule; he has, for example, shown that when, from a certain diet which has proved to maintain nutrition satisfactorily, the two amino-acids, arginine and histidine, were together removed, the diet, though amply sufficient in energy and fully assimilable, failed to maintain life. More recently Hopkins has attacked the question whether an animal's life can be maintained under the condition that, in place of protein or of the entire set of amino-acids constituting protein, a limited few of the several representative types of these constituents are provided in the diet. He shows that when, instead of the eighteen different amino-acids composing the protein, five only are administered, death rapidly ensues if those five be selected from the simpler aliphatic components—for example, leucine, valine, alanine, glycine, and glutamic acid; but that, on the other hand, nutrition and life are satisfactorily maintained, at least for a considerable period, if the five amino-acids given be chosen from the more complex types, such as tyrosine, tryptophane, histidine, lysine, and cystine, which experiment has shown to lie outside the range of the synthetic power of the animal body."

AVIATOR'S ASTHENIA.

Josué,[1] a recognized authority on the cardio-vascular system and adrenal disorders, gives an account of a common disability among aviators, characterized by three outstanding features: more or less well marked asthenia, low arterial blood pressure, and the appearance of Sergent's "white line," instead of the red streak seen in normal persons, on drawing the finger over the skin, especially that of the abdomen. In testing for the white line, which is a sign of adrenal inadequacy, it is important to avoid too much force, for in these circumstances it will not appear; further, a sharp object, such as the end of a pencil, must not be employed, for by detaching the squamous epithelium a fallacious white line might be produced. To this disability Josué gives the name aviator's asthenia; its obvious symptoms are familiar to flying men and their medical attendants, being largely included under the heading of staleness; but Josué takes a rather new line in ascribing them exclusively to adrenal inadequacy. A persistently low blood pressure is a danger signal, and to be forearmed it is advisable that the medical officer at the aerodrome should frequently take the blood pressures of the aviators. The disability occurs among hard-worked aviators, especially but not exclusively among those accustomed to fly at high altitudes; it may be due to excitement and strained attention, and in addition infections, usually of a mild degree, may play an etiological part. It therefore appears to correspond to the adrenal exhaustion described in other conditions of war by Crilé. The onset of symptoms may be gradual with progressive loss of vigour, or sudden fainting in the air may be the first observed sign of failing health. When the condition has developed, the aviator is subject while flying to attacks of faintness, invincible drowsiness, unaccountable loss of power and of self-control; while on land he suffers from malaise, muscular fatigue, want of energy, and he may be depressed or even neurasthenic. If the aviator continues to fly, the symptoms are aggravated. Rest, if sufficiently long, cures the disorder; it must be six weeks for a slight case, and two, three, or more months for one of an average severity. Treatment begins with ten to fifteen days of absolute rest in bed, followed by a few hours daily in a chair. The cure is hastened by the administration of adrenalin hydrochloride, which is also recommended as a prophylactic measure when the aviator's blood pressure is found to have dropped considerably.

TOBACCO AMBLYOPIA IN GERMANY.

Toxic amblyopia may be produced not only by tobacco, but by alcohol, quinine, male fern, and carbon disulphide. In spite of the fact that tobacco is so very commonly used,

[1] O. Josué, *Arch. de méd. et de pharm. mil.*, Paris, 1918, lxix. 609-628.

amblyopia due to it is a very rare disorder. Uhthoff found that it occurred only in 0.07 per cent. of out-patient cases. The pathology of tobacco amblyopia is not well understood; smokers of shag and tobacco mixture suffer most, and the condition, according to Parsons, is probably due to poisoning of the ganglion cells of the retina and consequent degeneration of the nerves connected with them. Fehr[1] reports that he has recently seen in private practice six cases of tobacco amblyopia, and consequently supposes that the condition has become unusually prevalent. All his patients showed the characteristic picture of tobacco amblyopia, in which diminution of visual power takes place gradually and simultaneously in both eyes, being caused by the appearance of a central scotoma in an otherwise normal visual field. The ophthalmoscope commonly revealed the usual pallor of the temporal half of the disc even at the beginning of the disease, though in many cases the optic nerve was at first normal. The course of the disease is chronic, and the prognosis relatively favourable: complete atrophy and blindness hardly ever occur, and, provided the condition is not too far advanced, considerable improvement of vision soon follows complete abstinence from tobacco. Complete recovery is possible, although as a rule, even in the most favourable cases, slight diminution of visual power and a small central scotoma persist. All Fehr's patients were heavy smokers, and consumed eight to twelve cigars a day. Alcoholism, which is frequently associated with tobacco amblyopia, could be excluded, as the war has caused a considerable limitation in the consumption of alcohol. Beer is inferior in quality and poor in alcohol, schnapps and liqueurs are difficult to obtain, and wine has become very dear. According to Fehr there are three possible explanations of the increase of tobacco amblyopia in Germany. In the first place there is more smoking now than in peace time, an unusual quantity of tobacco being consumed both in the trenches and at home to relieve nervous tension and privations, especially as other stimuli, such as tea and coffee, are becoming increasingly difficult to obtain. The second explanation is the inferior quality of the tobacco, the Bundesrath having sanctioned the admixture of beech and hop leaves, and lately also of lime tree, maple, chestnut, and vine leaves. The third possible cause is that the hardships and anxieties of war time have rendered men more susceptible to tobacco amblyopia. All Fehr's patients were men from 45 to 62 years of age, and all had lost a considerable amount of flesh and complained of general debility. In a postscript to the article which appeared on September 9th Fehr added that owing to the unfavourable conditions of the tobacco market the closure of cigar shops was imminent. The possibility of developing amblyopia would therefore be confined to tobacco hoarders.

THE PRESERVATION OF VACCINE VIRUS.

NOGUCHI finds[2] that vaccine virus retains its potency much longer when kept in distilled water than in glycerinated media, and is best preserved when emulsified in Ringer's solution or in 0.9 saline; the lower the temperature the longer the vaccine remains active. Glycerin is not, as is often assumed, an indifferent agent, but in high concentration is a powerful vaccinicide, and when used for the "ripening" process (elimination of bacteria) in a concentration of 40 per cent., as is ordinarily recommended, the virus is killed in the course of one to two months. Phenol in concentration above 2 per cent. destroys the virus within twenty-four hours at any temperature, but in strengths of 0.5 to 1 per cent. has almost no injurious effect and so is less harmful than glycerin. Iodine is very destructive to the vaccine virus, but its sodium and potassium salts do not reduce the potency of the vaccine even when mixed *in vitro* in 30 per cent. solution and kept for one hour at 37° C. As moist preparations of the virus rapidly deteriorate in tropical countries, it is important to determine exactly how much drying influences the virulence of the vaccine virus; experiments show that the loss of virulence, as proved by employing corresponding quantities of the dried and moist preparations, amounts to half or even more of its original strength, and that desiccation does not prevent the gradual deterioration due to age which takes place at various temperatures.

[1] *Berl. klin. Woch.*, 1918, lv, 854–5.
[2] *Journ. Exper. Med.*, Baltimore, 1918, xxviii, 425–442.

THE CONTROL OF VENEREAL DISEASE.

IN an article with this heading in the JOURNAL of November 30th, 1918, p. 608, we referred to the danger of the spread of venereal disease during demobilization, and the imperative need for increasing the facilities for treatment in this country and for multiplying the number of venereal clinics open to discharged men. We then expressed the belief that the importance of this matter was fully recognized by Sir Auckland Geddes, the President of the Local Government Board. We are now able to announce that practical steps are already being taken by the Board. In a circular dated December 10th (V.D. Circular 19), addressed to county and borough councils, it is stated that in view of the impending demobilization it is of extreme importance to secure at once a considerable extension of facilities for the free treatment of venereal diseases. Arrangements should be made for more frequent clinics at existing treatment centres, for the holding of evening clinics if this is not at present done, and for the provision of many additional centres. The councils should aim at providing a centre in every town with a population of over 20,000, and in some of the larger towns which already have one or more centres additional provision may be required. Where it is not practicable to provide sufficient centres by arrangement with the voluntary hospitals the councils themselves must establish them, either in their own premises or in premises acquired for the purpose. The Board attaches importance to the early provision of auxiliary centres where interim treatment of gonorrhoea can be given by a trained attendant under medical supervision. It is suggested that these centres might also admit, during the intervals between the attendances of the doctors at the regular clinics, persons who are apprehensive that they have contracted disease although there has been no professional diagnosis of the fact. Suggestions for the equipment and working of such auxiliary centres will shortly be issued. The councils of the more populous counties and the larger county boroughs are notified that they should at once consider the desirability of appointing a whole-time venereal disease officer with considerable experience in modern treatment, who would act under the administrative supervision of the M.O.H. He would undertake the clinical work at the treatment centres and auxiliary centres, with the help of part-time clinical assistants, or of a rota of general practitioners who have had special experience of the modern treatment of venereal disease, including a course of training at an approved centre. Hitherto the shortage of medical staff due to the war has made it difficult to carry out extensions of this work. Negotiations are, however, now proceeding with the naval and military authorities with a view to the early release of doctors with special experience of these diseases, and the Local Government Board hopes shortly to be able to supply a list of such medical men. We are glad to find that the views we expressed a fortnight ago are now taking practical shape.

IN DEFENCE OF THE COAL FIRE.

PROFESSOR A. W. BONE, F.R.S., in delivering the Lady Priestley Memorial Lecture before the National Health Society on December 10th, took for his subject "Coal and Health," and entered into a defence of the coal fire as against central heating. He agreed with Sir James Crichton-Browne, who from the chair of the meeting had already pleaded for a reprieve for the Englishman's

cheerful fireplace, that the open fire was not altogether the anachronism that some people believed. An anonymous writer in the *Manchester Guardian* had said that, just as our fathers in the dim past reared a fireplace as a rampart against invading beasts, so their descendants piled up a fire as a rampart against evil humours. In abolishing the open fire, said Professor Bone, we might save coal, but we should lose England. The mid-European, whose metabolism was highly stimulated by the cold, dry air and bright sunshine of his winter days, found positive relief in the stagnant atmosphere of his living rooms, heated by closed stoves, but the Englishman, oppressed by the humid air and sunless skies of his Decembers, rightly sought relief in radiant fires. Moreover, if, as modern physiologists claimed, it was at least as important to avoid monotony in the air of a room and to introduce movement as it was to raise the temperature, there was a good deal to be said on scientific grounds for the open fireplace, for its radiation was never the same two minutes together. He calculated that one ton of coal was equivalent to 30,000 cubic feet of gas, not 15,000 feet, which is the Coal Controller's estimate. The coal fire would be much less wasteful if chimneys were uniformly built, not on the outside but on the inside walls of houses. The efficiency of a coal fire, which might be 20 per cent. if the fireplace had a vertical back, would, he said, be 26 per cent. if it had a sloping back. The bottom of the fireplace should be shut in entirely by front shields, for free access of air to the base of the fire was wasteful; it was more economical to follow the plan suggested than to choke down the fire by dampers in the flue. The price of coal had gone up by more than 50 per cent., and he believed that a substantial proportion of this additional cost would remain as a permanent burden on the consumer, so that the question of fuel economy was not a matter of ways and means for a single winter.

THE ETIOLOGY OF INFLUENZA.

On November 2nd, in an article on this subject, we gave an account of some experiments reported by Nicolle and Lebailly to the Académie des Sciences, Paris. They afforded strong evidence that the virus was filtrable; the disease was produced by the filtrate of the expectoration. The experiments recorded in the short paper by Gibson, Bowman, and Connor, published at p. 645, giving a preliminary account of a research carried out at the request of Colonel Cummins, A.M.S., adviser in pathology with the British armies in France, confirm these results. Nicolle and Lebailly, whose paper was read to the Académie on October 14th, failed to produce the disease by injection into a monkey of the blood of a patient in the second day of a characteristic attack of influenza. At the next meeting of the Académie, on October 21st, Dujarric de la Rivière reported an experiment on himself, which appears to show that the filtrable virus may be present in the blood. He took 20 c.cm. of blood from each of four patients suffering from well-marked attacks of the disease. After defibrination he mixed the four bloods and passed the mixture through a Chamberland filter. He then inoculated himself subcutaneously with 4 c.cm. of the filtrate. On the fourth day he began to suffer from a marked attack of influenza. It would appear, therefore, to be pretty clearly established that the virus of influenza can pass through a Chamberland filter. It may be that it can do so only in some one phase of the cycle of its development, and in this connexion Hort's work, reported at various times in our columns, and in particular his paper on the meningococcus of Weichselbaum in 1917 (vol. ii, p. 377), will recur to mind. Those who accept his hypothesis may still maintain their belief in Pfeiffer's organism and may assume that it has a filtrable stage. On the other hand, the virus may be totally distinct, and the majority of the members of the War Office Conference last October were of opinion that the existence of some as yet undiscovered virus must be regarded as possible.

ENLARGED THYMUS AND ACUTE LYMPHATIC LEUKAEMIA.

In recording a case of the association of enlarged thymus with acute lymphatic leukaemia, Major[1] raises some interesting points. The status thymolymphaticus and leukaemia have been thought by Herz to be definitely related to each other; in Major's case the thymus weighed 189 grams instead of about 10 grams, and showed microscopic evidence of persistent thymus tissue undergoing hyperplasia with subsequent degeneration. The supervention of acute lymphocytic leukaemia in an individual with a persistent thymus suggests that the persistent thymus indicated an abnormal condition of the lymphoid tissues of the body favourable to disease of these tissues and eventually developing into the leukaemia. The recognized association of a thymic tumour with leukaemia has been regarded in more than one light; the most obvious view is that the thymic condition is an infiltration and secondary to the leukaemia, but it has been suggested that the thymic tumour is the primary lesion, and that there is a thymic as opposed to a myelogenous leukaemia, or that there is a primary sarcoma of the thymus with secondary leukaemia. In this connexion it is interesting to refer to Sternberg's description of leucosarcoma, in which, together with leukaemia (large lymphocytes), the organs of the body show definite tumours, differing from those in chloroma in being unpigmented. Of the six cases of leucosarcoma described by Sternberg in 1903 there were three with thymic tumours, and ten years ago R. C. Cabot considered that there were transitions from ordinary sarcoma through Sternberg's leucosarcoma, and through myeloma, to leukaemia of the ordinary type.

THE FUTURE OF THE DISABLED MAN.

In a note under this heading last week we referred to the serious warning given by Mr. John Galsworthy, editor of *Reveille*, as to the inadequacy of the provisions at present made for disabled men, whose condition might, with proper treatment, be very greatly improved, and we mentioned also the statement of the Director-General A.M.S., as to the action the War Office proposed to take in view of the fact that the Ministry of Pensions has no adequate accommodation or trained staff. The Secretary of the War Office announced on December 9th that under instructions from the War Cabinet it has been decided that, for a period of six months from December 3rd, 1918, the War Office will continue to afford treatment in military hospitals for all serving soldiers requiring prolonged treatment, and will also provide accommodation and treatment for pensioners during that period. The *Times* announced on December 12th that Colonel A. L. A. Webb, C.M.G., R.A.M.C., has been nominated to succeed Sir John Collie, Director of Medical Services in the Ministry of Pensions, and added that it is now assured that the medical departments of the Army and the Ministry of Pensions will work in the closest possible harmony and co-operation to attain the same purpose—namely, the welfare of the disabled soldier. Colonel Webb, who entered the R.A.M.C. in 1899 and served in the South African war, has been for some time Assistant Director-General in charge of the hospitals branch of the Army Medical Department.

[1] R. H. Major, *Bull. Johns Hopkins Hosp.*, Baltimore, 1918, xxix, 206.

THE Greek Academy of Medicine has recently been founded at Athens. Professor Alivisato has been elected president and Professor Portocalis secretary.

A HOSPITAL to form the nucleus of a medical department is to be built on the campus of the University of Washington, Seattle, at a cost of £200,000.

THE WAR.

THE PENALTIES OF RAPID SUCCESS.

THE great British advance may be said to have opened with the battle which began on August 8th. During the next three months our troops fought their way forward and through the frightful wilderness from Amiens to Le Cateau. In following them and ministering to their needs the medical services had to contend with difficulties that are almost past description. Behind our advancing line the field ambulances and the casualty clearing stations laboured to keep up with the fighting troops. As the fighting troops pushed on faster and faster, the distances the wounded had to travel grew longer and longer. Though the attack was opened by one Army, soon all the other Armies were engaged, and any idea of the interchange of surgical teams became out of the question. All this was explained in the JOURNAL of November 9th, p. 526.

Although the casualty clearing stations travelled with less and less equipment, due to the need for economy in time and transport, they never could move forward quickly enough, owing to the impossibility of obtaining adequate transport. As the advance proceeded still more rapidly the medical arrangements grew progressively sketchier; the wounded had to be carried longer distances before there was any chance of operating on them, and this of course seriously diminished their chances of deriving any benefit from operation, even had the number of medical officers been sufficient to cope with all the cases that came in. Moving ever forwards, and shedding their equipment as they moved, the accommodation of the casualty clearing stations was inadequate for the numbers of wounded flowing backwards from the field ambulances; marquees often had to be pitched in a summary way, and when the weather grew colder the difficulty of getting fuel and enough blankets was considerable. Another drawback was that no disinfectors adapted for travelling on shell-wrecked roads were available. Owing to the destruction of railway lines the ambulance trains could not always be got to the places where they were most wanted.

All this entailed much suffering on the wounded, but the medical services had to make the best shift they could in the face of unbelievable difficulties; it was part of the price of military success, and of our amazingly rapid advance continued for so long. Those who have not had personal experience can scarcely realize how much transport of the wounded depends on adequate railway communications; even on the best of roads the wounded cannot be evacuated all the way from the clearing station to the base by motor ambulance. The first stage of the journey can be made by road, if it is not too long; but when the patient has been operated on, or when sepsis has begun, he must travel by train, except in the comparatively rare event of barge transport being available.

The battle continued to rage furiously until November 11th, when the armistice was signed and hostilities ceased; but the troubles of the medical service did not stop, but rather grew worse. The troops advanced without fighting, and the medical units had to push on behind them even faster than before; the clearing stations grew still lighter in equipment and weaker in medical officers. It was generally supposed that, because there were now no fresh wounded cases, the work would become much simpler. Events proved, however, that this expectation was vain. Within a few days there came towards the medical units of one at least of our armies a growing stream of released prisoners of all the allied nationalities, abandoned by their captors—underclad, unfed, many of them very sick indeed, and all horribly verminous. The taking over of released prisoners was, of course, no business of the medical services unless they arrived within our lines suffering from illness. In this respect the experience on different parts of the front has varied considerably. In some sectors the condition of the men returning through our front lines was much better than had been expected. Side by side with the released prisoners there came to the medical units of the field armies an endless stream of cases of influenza, many of them of a most severe type.

The British Red Cross has done a great deal of good work and rendered most valuable assistance to the army in getting prisoner patients away. Nevertheless, the field ambulances and clearing stations have been crowded, while still the railway lines lagged miles behind. Thus the sick had to travel in motor ambulances through desolated country by long daily stages, sometimes for five days at a stretch, before they could reach a railhead, and then the clearing stations were often so crowded that only the very worst cases could be retained. Here and there buildings could be found for the clearing stations, but in many places the patients had to be housed in marquees hastily pitched on the mud. Yet it passes the wit of man to conceive how these miserable conditions could have been bettered at the time. There was an impassable break in our railway lines, and although men worked day and night to repair them, it all took time, and without trains it was barely possible to get food up to the troops in front as they advanced into Germany. All the traffic of the forward area therefore fell upon the roads, with the natural result that the roads broke up under the ceaseless grinding of the heavy lorries, and the lorries themselves broke up on the ruined roads. Transport by motor ambulance over such a surface is a trying experience, but it was the price which had to be paid for our victorious advance. Clearly where such conditions exist there is work enough for many medical officers. Things have begun to improve a little already, but real relief can only come when the railway lines have been established and ambulance trains can be pushed forward. So far as France is concerned this has been, perhaps, the hardest chapter in the medical history of the war. Until it is closed there is force in the plea that too many medical officers should not be withdrawn from the army under the impression that the war is over.

THE ITALIAN DISPATCH.

THE dispatch of General the Earl of Cavan, K.P., K.C.B., Commanding-in-Chief British Forces in Italy, dated November 15th, 1918, deals with the period from September 15th to the final defeat of the Austrian army and the conclusion of the armistice on November 4th. On October 6th Lord Cavan was placed in command of the Tenth Army, consisting of the 11th Italian and the 14th British Corps. Operations began on the night of October 23rd-24th, when the main channel of the Piave, which was in flood, was crossed in boats by a small force consisting of artillery and the 1st Battalion Royal Welsh Fusiliers. They secured part of an island on the eastern side of the main channel of the river and the whole was occupied by other forces twenty-four hours later. The attack on the east back of the Piave began on the morning of October 27th and was eventually successful, although many bridges were broken down that night and a number of gallant men were drowned. By October 29th the enemy's defence was giving way, and on October 30th his defeat became a rout; about 28,000 prisoners were taken by the 14th British Corps. The rapid advance of the troops made heavy demands upon the transportation services and also upon the supply and transport services, but the supply of ammunition and rations was maintained in spite of hastily constructed bridges and long distances from railheads. The dispatch contains the following reference to the medical service:

> The fresh influenza epidemic, which broke out shortly before the commencement of the operations, threw a heavy and additional strain on the medical service. Despite this the evacuation and care of both the sick and wounded was rapidly and satisfactorily carried out. All the arrangements were most ably organized by my Director of Medical Services, Major-General F. R. Newland, C.B., C.M.G.

The following note is made of the good work done by the British Red Cross Society:

> In their retreat the Austrians left many hospitals full of sick and wounded of all nationalities behind them. In many cases these hospitals were bereft of provisions and attendants. The British Red Cross, under the supervision of Colonel Sir Courtauld Thompson, K.B.E., C.B., spared no efforts to alleviate the sufferings of the inmates, and undoubtedly saved the lives of many Austrian as well as Italian patients.

CASUALTIES IN THE MEDICAL SERVICES.

ROYAL NAVY.

Died on Service.

SURGEON LIEUTENANT M. E. JONES, R.N.

Surgeon Lieutenant Myrddin Emrys Jones, R.N., died of pneumonia, aged 23. He was the second son of Alderman R. E. Jones of Boderwydd, Llanberis. He received his medical education at St. Thomas's Hospital, and took the diplomas of M.R.C.S., L.R.C.P.Lond., in January, 1918. After serving as house-surgeon to St. Thomas's Hospital he obtained a temporary commission in the navy, and was appointed to H.M.S. *Indomitable*.

SURGEON LIEUTENANT W. H. PICKUP, R.N.

Surgeon Lieutenant William Howard Pickup, R.N., died on service on November 27th, at the age of 34. He was the youngest son of Dr. W. J. Pickup of Coventry. He was educated at the University of Birmingham, and took the diplomas of M.R.C.S., L.R.C.P.Lond. in 1915, after which he obtained a temporary commission in the Royal Navy. He was removed from his ship to Eston Hospital, Middlesbrough, suffering from influenza, and fatal pneumonia supervened.

ARMY.

Killed in Action.

CAPTAIN H. W. WHITE, R.A.M.C.

Captain Hill Wilson White, R.A.M.C., was reported as missing from April 12th, and is now presumed killed on that date. He was born at Kalapol, New Zealand, the fourth son of the Very Rev. F. W. White, Dean of Christchurch, Dublin, and was educated in the medical school of the Royal College of Surgeons, Ireland, graduating M.B., B.Ch., and B.A.O. of the National University of Ireland in 1910. After acting as resident anaesthetist, senior house-surgeon, and casualty officer at the Metropolitan Hospital, and as assistant medical officer of the Manor and Long Grove Asylums at Epsom, he was filling the post of assistant medical superintendent of the Paddington Infirmary when the war began, and took a temporary commission as lieutenant in the R.A.M.C. on September 10th, 1914. He was promoted to captain after a year's service, and was wounded at Ypres in December, 1915. His younger brother was killed in the battle of the Somme in July, 1916.

Died on Service.

LIEUT.-COLONEL M. A. T. COLLIE, I.M.S.

Lieut.-Colonel Mackintosh Alexander Thomas Collie, Bombay Medical Service (ret.), died at Barrow-in-Furness of pneumonia after influenza, on December 3rd, aged 62. He was educated at the Universities of Edinburgh and Aberdeen, and after taking the diplomas of L.R.C.S.and P.Edin. in 1878, graduated M.B. and C.M.Aberd. in 1881. Entering the I.M.S. as surgeon on March 31st, 1883, he became surgeon-major on March 31st, 1895, and lieutenant-colonel on March 31st, 1905, retiring on June 30th, 1913. He was appointed secretary to the Surgeon-General, Bombay, in March, 1888, and in December, 1892, resident surgeon of St. George's Hospital, Bombay, and professor in the Grant Medical College, Bombay. From October, 1895, to the end of 1902 he held various civil surgeoncies; in January, 1903, he was appointed a Presidency surgeon, Bombay, and in November, 1905, physician to St. George's Hospital, Bombay, holding that post till his retirement. He rejoined for service in the present war on October 20th, 1914, served for some time on a hospital ship, and in 1915 at the Indian hospitals at Brockenhurst, and later at the Pavilion, Brighton. In the early part of 1916 he was for some months in charge of a military hospital at Malta, and afterwards was appointed president of No. 3 recruiting medical board at Manchester. While acting as president of a colliery recruiting medical board, in February, 1917, he contracted pneumonia, from the effects of which it is probable that he never fully recovered. On rejoining for duty he was posted to the command of the military hospital at Barrow, and held that post till his death.

CAPTAIN D. COTTERILL, R.A.M.C.

Captain Denis Cotterill, R.A.M.C., died of influenza, on December 2nd, at No. 50 Casualty Clearing Station in France. He was educated at the University of Edinburgh, graduating M.B. and Ch.B. in 1906 and taking the diploma of F.R.C.S.Ed. in 1910. After acting as clinical assistant and as house-surgeon to the Royal Infirmary, Edinburgh, he went into practice there, and was appointed assistant surgeon to the infirmary. He took a temporary commission as lieutenant in the R.A.M.C. on July 9th, 1917, and was promoted to captain after a year's service. Captain Cotterill was the eldest son of Mr. J. M. Cotterill, C.M.G., F.R.C.S., consulting surgeon to the Edinburgh Royal Infirmary, and lieutenant-colonel R.A.M.C.(T.). Colonel Cotterill had already lost his youngest son (John) early in the war, and also his son-in-law, Dr. W. G. Porter. The sympathy of the profession, and in a special manner that of Edinburgh graduates, will go out to Mr. Cotterill in this fresh sorrow.

CAPTAIN W. R. O'KEEFFE, R.A.M.C.

Captain William Robert O'Keeffe, R.A.M.C., was reported as having died on service, in the casualty list published on December 5th. He was educated at Queen's College, Cork, and in the medical school of the Royal College of Surgeons, Ireland, in Dublin, and took the diplomas of L.R.C.P. and S.I. in 1912, after which he went into practice at Sheffield. He took a temporary commission as lieutenant in the R.A.M.C. on May 10th, 1917, and was promoted captain after a year's service.

ASSISTANT SURGEON A. R. EASDON, I.S.M.D.

Assistant Surgeon Arthur Randolph Easdon, I.S.M.D., died of pneumonia on active service on September 10th, aged 25. He was born on December 16th, 1892, and entered the I.S.M.D. on April 20th, 1914.

Wounded.

Captain G. W. Mitchell, R.A.M.C. (temporary).
Lieutenant R. R. MacGregor, R.A.M.C. (temporary).

Repatriated.

Captain C. H. C. Byrne, R.A.M.C. (temporary).
Captain C. E. Redman, R.A.M.C. (temporary).

DEATHS AMONG SONS OF MEDICAL MEN.

Beach, Lionel F. H., D.S.O., Captain the Queen's Royal West Surrey Regiment, son of Dr. Fletcher Beach, died of bronchopneumonia on November 28th, aged 26. He held a commission in the 4th Territorial Battalion of the Queen's, in which he attained the rank of captain on August 7th, 1917.

Beesley, Anthony Blayton, Second Lieutenant Royal Air Force, second son of Dr. Beesley of Exmouth, died of pneumonia at Huntingdon on December 1st, aged 18.

Bontor, Lawrence Sidney, Lieutenant R.N., aged 22, younger son of Dr. Sidney Bontor of Berkhamsted, Herts, killed in action in the North Sea about October 6th, 1918. Educated at Osborne and Dartmouth, he had served throughout the war, including the battle of Jutland, and for the past year had served in submarine.

Carr, Donald Nevill, Captain South Persian Rifles, only son of Dr. Carr, C.M.S., Ispahan, died of pneumonia at Saidabad, Persia, November 26th, aged 23.

Eccles, A. J. T., Lieutenant Royal Engineers, 5th Division Signal Company, third son of Dr. Tolcher Eccles of Hove, died of influenza on November 26th, at No. 4 Casualty Clearing Station, France, after three and a half years' service, aged 21.

O'Conor, Ronald Ramsay, Second Lieutenant Coldstream Guards, younger son of Dr. O'Conor of Buenos Aires, and of Freshwater, Isle of Wight, died of pneumonia at Queen Alexandra's Military Hospital, Millbank, on November 30th, aged 19.

Patton, Idris Knox, Lieutenant R.A.F., only child of Dr. James Patton of Gateshead-on-Tyne, died on November 25th at the Military Hospital, Tidworth, from pneumonia following influenza. He was educated at Bilton Grange, Harrogate, and matriculated at the University of Durham, where he became a student of medicine. He obtained his commission in the R.A.F. in September, 1917, and received his "wings" three months later. At the time of his death he was acting as flying instructor in wireless telephony.

[We shall be indebted to relatives of those who are killed in action or die in the war for information which will enable us to make these notes as complete and accurate as possible.]

HONOURS.

Surgeon Lieutenant J. G. Dobson, R.N. (H.M.S. M. 25) has been appointed to the Distinguished Service Order for services in the White Sea operations, 1918:

Though wounded by the explosion of a shell, he carried out all operations that could be effected on the wounded, working continuously from 7 p.m. till 10 p.m., when he collapsed. Throughout this time Surgeon Lieutenant Dobson went about his work as if nothing had happened.

The Distinguished Service Order has also been awarded to Surgeon Lieutenant Commander C. V. Griffiths, R.N., for services on the Mediterranean Station between January 1st and June 30th, 1918.

Surgeon Lieutenant Commander W. E. Ormsby, R.N., and Surgeon Lieutenant L. F. Strugnell, R.N., have been mentioned in dispatches for services on the Mediterranean Station.

The name of Major E. Gibbon, R.A.M.C., has been brought to the notice of the Secretary of State for War by Major-General L. O. Fitzmaurice Stack, acting Sirdar and Governor-General of the Sudan, for distinguished and gallant service in the field in connexion with the operations carried out in the Nyima Hills, Nuba Mountains Province, Sudan.

England and Wales.

Transfer of Functions of Poor Law Authorities.

At the meeting of the London County Council on December 10th various committees furnished their observations on the report of the Local Government Board committee appointed in 1917 on the transfer of the functions of Poor Law authorities in England and Wales. The Public Health Committee regarded the proposal to transfer to the Council as public health authority the arrangements for the provision of institutional treatment for the sick and infirm, the aged, maternity cases, and infants a proper and useful step in the direction of a unification of services. The Midwives Act Committee was of opinion that it would be a great advantage if in London, where the Council was the local supervising authority under the Midwives Act, the training and teaching of midwives as well as the arrangements for providing institutional treatment in difficult and dangerous cases which arose in the practice of certified midwives were under the same authority. The Asylums and Mental Deficiency Committee considered that the transfer to the Council of all the London Poor Law institutions would facilitate the provision of accommodation for cases of mental derangement at an early hopeful stage. In view of these and other expressions of opinion, the Council gave a general approval to the fundamental principles laid down in the report of the Government Committee.

Schools for Tuberculous Children.

The London County Council has decided to establish a number of schools for tuberculous children. Four years ago it was estimated that in London 1,000 children were excluded from the elementary schools on account of tuberculosis. A subcommittee now gave the number of children definitely notified as tuberculous as approximately 2,000, and, in addition to these, 2,000 other children required open-air education owing to anaemia, debility, or incipient tuberculosis. It is proposed to establish twenty day schools, each accommodating 100 children, for the definitely tuberculous. The schools will be provided in the outlying parts of London, preferably in large private houses with grounds of fair dimensions (though some disused army huts may be adapted for the purpose), and near a tram route. For the 2,000 other children not notified as tuberculous but needing open-air treatment, eight open-air schools are to be provided, in addition to the two already in existence. Admission to both classes of schools will be restricted to children who have been certified by the school medical officer. The capital cost of the whole scheme will be about £108,000, with £58,000 a year for additional maintenance.

Sanatorium Benefit in London.

In providing sanatorium benefit for 1919 the London Insurance Committee estimates for 519 beds for civilian patients and 300 beds for discharged sailors and soldiers. The expenditure anticipated in respect to civilian patients is £97,115, and, after allowing for the credit from the Insurance Commissioners, the estimated deficiency at the end of 1919 will be £29,665. A special committee is to interview the chairman of the Joint Committee with a view to securing the necessary income. In the case of the discharged sailors and soldiers any deficiency will be made good from the exchequer, and the new financial arrangements with regard to these persons will come into operation on January 1st. The Committee was responsible on November 1st last for 304 discharged service men in institutions and 441 civilian patients, and on the waiting list were 134 of the former and 169 of the latter. In the case of discharged men in an advanced stage of tuberculosis who have been admitted by the Committee to institutions without waiting for information as to whether the Pensions Ministry was prepared to accept financial liability, the Ministry has agreed to accept liability up to ten days after the date of a letter intimating the contrary when it is found that the tuberculosis is not due to or aggravated by service.

Galyl.

At a meeting of the London Insurance Committee on November 28th reference was made to a previous decision of the Committee that galyl should not be supplied to insured persons at the cost of the Drug Fund. The reason for this decision was that any practitioner who had qualified himself in the treatment of venereal disease could obtain supplies of galyl from the County Council through the Medical Officer of Health. When this decision was reported to the Insurance Commissioners they replied that it was not within the power of the Committee by any general pronouncement to limit the rights of insured persons with regard to the medicaments to which they were entitled as part of medical benefit, nor to issue any general prohibitions to practitioners from obtaining at the cost of the Drug Fund such "proper and sufficient medicines" as they might find requisite for their medical treatment of any particular case. It appears, however, that as a fact no prescription of galyl had been disallowed by the London Insurance Committee; the matter had been raised on prescriptions dispensed, but such prescriptions had been accepted and paid for by the Committee. Such a pronouncement as has been made by the Insurance Commissioners was perhaps to be expected from them, but it is unfortunate that they should feel impelled to take so rigid a view as to consider that they had no discretion to adapt their administration to meet the venereal scheme of the Local Government Board.

Scotland.

The Ministries of Health Bill.

At a meeting of the Insurance Committee for the county of Argyll the opinion was expressed that the scheme of the Ministries of Health Bill so far as it related to Scotland was unsatisfactory. It was considered that there should be a Ministry of Health for Scotland, with standing and power corresponding to that of the Ministry for England and with a Minister in Parliament; that the Scottish Consultative Council should include directly appointed representatives of labour and of the medical profession, and that the powers and duties of the Scottish Ministry of Health should include at the outset (*a*) all the powers and duties of the Local Government Board for Scotland, (*b*) all the powers and duties of the Scottish Insurance Commissioners, (*c*) all the powers of the Scottish Education Department with respect to the medical inspection and treatment of children and young persons, (*d*) the Department of the Registrar-General for Scotland, (*e*) the Highlands and Islands Medical Service Board.

Examination for Nursing Certificates.

At an examination held by the Local Government Board in Scotland for the certification of trained sick nurses and fever nurses 214 candidates presented themselves. Examinations were held in Glasgow, Edinburgh, Dundee, and Aberdeen. The subjects were elementary anatomy and physiology, hygiene and dietetics, medical and surgical nursing, midwifery, and infectious diseases (for fever nurses only). Seventy-six candidates passed, and, subject to the completion of three years' training in hospital to the satisfaction of the Local Government Board, are entitled to the certificate of efficiency granted by the Board.

Ireland.

TRAVELLING EXPENSES OF REGISTRARS OF BIRTHS, DEATHS, AND MARRIAGES.

WITH very few exceptions dispensary doctors are the registrars of births, deaths, and marriages in Ireland. The Treasury has issued for these officials a revised scale of travelling expenses when making their visits to the superintendent registrars with their quarterly returns. Notwithstanding the great increase in travelling expenses in recent times, the Treasury has reduced the rate of mileage from 6d. to 5d. a mile in the case of doctors using two or three seated motor cars. The proprietors of motor cars for hire in Ireland will not undertake to drive a fare for less than eighteen pence a mile. The obvious remedy for the registrars is to inform the Treasury that they will only take their books to the superintendent registrar when the Treasury, by its own negotiations, supplies them with a conveyance for the purpose.

Correspondence.

POST-GRADUATE TEACHING AND THE UNIVERSITY OF LONDON.

SIR,—The recent discussion at the Medical Society of London on reconstruction in medical education was marked by two significant statements. Professor Adami, speaking apparently from intimate knowledge, stated that Paris would probably become the chief centre of post-graduate teaching in Europe, since the French were making every preparation to capture the position hitherto held by Vienna and Berlin, adding that it moved him almost to "anger" that the claims of London should go by default. Also, Colonel Waring, speaking as a member of the Senate, and presumably better informed than other people, stated that in his opinion little could be expected from the University of London—that is, to improve from the imperial point of view the situation which Professor Adami deplored.

Most of us must surely feel that in comparison with the serious fact that the centre of gravity of medical learning and teaching is about to be shifted and that our country is to have no part in the new order, the other matters under discussion, such as whether applied anatomy should be taught by anatomists or surgeons, and the exact relationship of midwifery and gynaecology, are of almost trivial importance.

The case for the establishment of a real centre of post-graduate teaching in London needs no argument. I understand that proposals are on foot for this purpose. What I should wish to urge is: (1) That no scheme can be satisfactory that does not make special provision for instruction in certain branches of medicine which at present find no place in medical teaching; (2) that systematic teaching in these subjects must be combined with facilities for and encouragement in research; (3) that in order to give sufficient authority and attractiveness to post graduate teaching in London the teachers in these subjects must be university professors.

To particularize: the action and uses of physical remedies—light, heat, cold, mechanical impressions, movements, electrical currents, and rays of every kind—are either not taught at all or in an entirely inadequate and occasional manner. These physical agencies are embraced in a group of allied sciences—hydrology, climatology, mechanotherapy, electrotherapy, radiology—all of them of absorbing interest, which have now become, especially since the war, of immediate practical medical and public importance. How far it is consistent with the public interest or with the dignity of the medical profession that branches of medicine should be practised without being taught your readers can judge.

The case for research is equally clear, for our experimental knowledge of the intimate action of these agencies upon the body is only now beginning, and research must go hand in hand with clinical study and teaching.

I believe that the Universiy of London professes to concern itself to supply teaching in special subjects of importance for which no room has been found in the formal curriculum. Since the boundaries of medicine are always extending there must always be these unoccupied territories. Undoubtedly the recognition of these provinces of learning by the university and the provision of university teaching therein confers upon the subjects taught a certain authority and status not otherwise obtainable, which in a medical subject will ensure in time a higher standard of qualification and practice.

If happily now a great centre of post-graduate teaching and research is set up in London, I venture to think that the university will do a great public service by placing the various branches of teaching under university professors; and, *pace* Colonel Waring, I hope that the university may in this way play a leading part in the reconstruction of medical education.—I am, etc.,

London, W., Dec. 10th. R. FORTESCUE FOX, M.D.Lond.

TEMPORARY PEG LEGS.

SIR,—I have read with much interest the report by Major Chapple, R.A.M.C. (November 30th) on temporary pegs for amputation of the lower limb. I have recently been making a number of plaster pylons, but before trying to put them on I consulted Mr. Woodland, a maker of artificial limbs in Southampton, and the following were the chief points he urged:

1. That in leg stumps, as well as in thigh stumps, the bucket should be around the thigh, as the main point of support of the body weight should be at the tuber ischii, the patient, as it were, sitting on the upper edge of the bucket, and that in the case of plaster pylons, to avoid friction, it would be as well to incorporate a felt pad between the layers of the plaster bandage where the edge of the bucket would press against the tuber ischii.
2. That in leg stumps the part of the leg below the knee is simply of use as a lever for bending the knee-joint. He had never seen a successful artificial leg where the bucket was around the leg instead of around the thigh, even when hinged to a corset around the thigh.
3. That there should be no pressure at all on the end of the stump from any part of the apparatus.

By following this advice, I have now made a number of plaster pylons which patients wear without discomfort; after a few days' practice they can walk several miles. The tendency for the plaster-of-Paris to crumble can be to some extent obviated by coating the inside as well as the outside of the bucket with No. 7 paraffin.

Mr. Woodland's principles appear to differ very much from those of Major Chapple, who in his report writes:

An ideal bucket will therefore have a smooth and almost shiny inside surface, with a diaphragm so placed as to carry a maximum portion of the weight of the body on the end of the stump, and a rim so contrived and shaped as to carry the remaining portion of the body weight by coaptation to the appropriate bony surfaces, near the adjacent joint.

He also describes and figures various auxiliary pegs where the bucket is applied to the leg stump in amputations below the knee, instead of to the thigh.—I am, etc.,

Southampton, Dec. 3rd. G. D. FREER, M.B.Lond.

BOOT HEELS AS A CAUSE OF FLAT-FOOT.

SIR,—With reference to Dr. Samways's remarks, let me say that I mentioned that with heelless boots the weight falls mostly on the heels, with low heels entirely on the arch and with high heels mostly on the metatarso-phalangeal joints, in the latter case being transmitted lengthwise along the tarsal and metatarsal bones and not falling on the arch. Consequently, with high heels the arch is preserved. Owing, however, to spastic peronei and idle tibialis anticus the crown of the arch rotates somewhat downwards and inwards around the long axis of the foot, power and elasticity being thus sacrificed and the arch becoming practically rigid. A five mile walk with 3 in. heels would convince Dr. Samways that high heels make corsets necessary. The weight of mountaineers descending steep slopes falls mostly on the heels. If it fell on the arch (that is, at right angles) they would descend head first. Walking on the heels when descending and plentiful exercise of the tibialis anticus when ascending account for their erect carriage (without corsets). Boot heels raise only the posterior narrow parts of the feet, which are not very sensitive to cold. The boot described is as elegant and warm as ordinary boots. The bare feet of men lying on their sides are at a more obtuse angle than when standing with boots on. Spastic calf muscles and undeveloped

tibialis anticus explain this; Dr. Samways's theory does not.

The hip-joint being further from the toes than from the ground the advancing foot (walking) must be dorsiflexed or the knee bent in passing the other foot. When barefooted dorsiflexion takes place. With heels on both boots, the spastic calf muscles prevent dorsiflexion, and the knee is flexed. This flexion prevents gravity carrying the knee past the other, and it has to be raised. Observation confirms this.

The foot of a man who has always worn heeled boots is not normal. His heels project further behind, and his balance falls further forwards than Nature intended. Standing tiptoe exercises unfortunately strengthen the powerful gastrocnemius and soleus, whose action flattens the arch when the weight is on the ankle-joint. Plantar flexion, sitting, strengthens the other calf muscles and the arch without exercising the gastrocnemius and soleus.

Using boot heels is equivalent to jacking up one end of an inverted motor car spring with a solid block, thereby reducing its resilience to that of a half spring. The tibialis anticus represents the shackle that keeps the spring in the right plane and holds it up to its work, like the bow-hand in archery. The foot in infantile paralysis should be put up fully dorsiflexed and inverted.

When heelless boots are used the feet should be kept parallel and a pendulum gliding movement of legs and feet adopted, the steam-hammer method of putting the feet on the ground being abandoned. The knee need scarcely be flexed, but the foot must be dorsiflexed in passing the other. The development the tibialis anticus then undergoes and the rapid improvement in the arch are "startling."—I am, etc.,

S. D. FAIRWEATHER,
Captain R.A.M.C.

Kenmore, Nov. 26th.

THE CONTROL OF VENEREAL DISEASES.

SIR,—The paragraph (p. 608) on the control of venereal diseases deals ably with a subject of vital importance, but fails, in my opinion, on one point—namely, in not emphasizing enough the necessity of treating gonorrhoea correctly. In the lay and medical press attention seems to be focussed chiefly on syphilis. Health authorities strive to instruct medical men in the administration of the salvarsan remedies, strive eagerly to get patients to undergo treatment, yet the ravages of the gonococcus are touched upon lightly.

While admitting the great value of the newer remedies in treating syphilis and the importance of the general practitioner being capable of administering these remedies himself, yet I would hesitate to assert—and he would be a brave man who did so—that the patient having undergone this treatment is cured of the syphilitic taint for ever; for who with experience of these remedies has not had the misfortune to get a return of a positive reaction after months and years of absence?

But with gonorrhoea it is different; untold harm is done through bad, or rather incomplete, treatment. Every venereologist has listened to the wailings of the man with chronic urethritis, every gynaecologist knows how restricted his field would be if there were no gonococci, and every medical officer of health has something to say about ophthalmia neonatorum, yet millions of men and women are allowed to go about potential agents of infection, supposed to have had treatment and supposed to be cured. This should not occur. No case should be discharged as cured until a careful examination of all the organs connected with the urethra is made, including patient microscopical search for the germ; yet it is not uncommon to hear medical men assert that they can cure gonorrhoea within a week; their criterion of cure is the cessation of the purulent discharge. What a fallacy! I fear to encroach further upon your space, otherwise I would have something more to say on the subject of chronic urethritis. I conclude with a hope that whoever has the power to make arrangements for the treatment of venereal diseases will emphasize the importance of facilities for treating gonorrhoea, and will take as much trouble in educating the general practitioner how to treat this disease as he has taken in teaching him how to insert a needle in a vein.—I am, etc.,

M. W. BROWDY, M.B.

Manchester, Nov. 30th.

THE BOARD OF CONTROL ON EARLY TREATMENT OF MENTAL DISORDERS.

SIR,—I have read with much interest your leading article in the JOURNAL of November 30th, p. 607, on the report of the Board of Control on lunacy. Valuable suggestions are made as to the treatment and diagnosis of cases of mental disorder incipient in character or of recent origin. But these suggestions entail the removal of the patient from his home for the purpose both of diagnosis and of treatment. In this particular disease I cannot help thinking that this procedure is not the best. I should have thought that it was better, certainly for diagnosis, and probably for considering treatment, to see the patient in his natural surroundings, so as to be able to form a proper opinion of the influence of his home, his home life, his way of living, and his surroundings generally, and so as to get a more accurate idea of his family history.

To meet this point I suggested, in a letter to your contemporary the *Lancet* on November 16th, that in any case of suspected mental disease the practitioner in attendance should have the right of calling in an appointed specialist, just in the same way as he can now do in the case of suspected tuberculous disease. If this was done—and it could be arranged that the medical attendant should meet the specialist in consultation—not only would it be of advantage to the patient, but the general practitioner would have the advantage of what would in fact be a clinical lecture, and the consultant would have the advantage not only of seeing the patient in his ordinary surroundings, but of learning his previous history from the family medical attendant. In that letter I made the suggestion that the most suitable person to appoint as specialist would be the medical superintendent of the county asylum of the area in which the patient resided.—I am, etc.,

CHAS. E. S. FLEMMING.

Bradford-on-Avon, Dec. 3rd.

THE PAST AND FUTURE OF THE CRUSADE AGAINST TUBERCULOSIS.

SIR,—If the tuberculin reaction is an anaphylactic phenomenon, there is abundant evidence that in infants any tuberculin reaction is due to post-natal infection, and therefore I do not understand what Dr. R. E. Tottenham means by saying that "the state of anaphylaxis is transmissible by the mother, and possibly to some extent by the father."—I am, etc.,

W. CAMAC WILKINSON, M.D.

London, W., Dec, 10th.

REMUNERATION OF RURAL PRACTICE UNDER THE INSURANCE ACT.

SIR,—I think it would be useful to have some further expression of opinion on the part of rural practitioners as to renewal of contracts under the National Insurance Act before we are invited to do this.

The conditions in rural and urban practices are so utterly different, especially in respect of distances, cost of travelling, and cost of drugs, that rural practitioners may have to take their own line in the matter of further service under the Act. The doctors I have in mind are those in one-man and two-man villages and townlets, with panels of 250 to 1,000 patients, and a radius of five or six miles.

My own opinion is that the multitude of rules and regulations which have been imposed on us, and the bureaucratic way in which we have been answered, when appeals have been made for consideration in view of conditions due to the war and unforeseen when we entered into the contracts, have proved to the hilt the soundness of the contention in 1912–13 that the conditions of service were derogatory to the profession.

I think it is generally agreed that these conditions have only been tolerated thus far from a patriotic desire not to embarrass the Government while the war continued, but this need is no longer operative, and some clear thinking is required before the day when contracts are presented for renewal.

We are scattered all over the country and have no means of meeting, as have urban doctors, and there seems no available or more suitable channel for the expression of opinion than the columns of the BRITISH MEDICAL JOURNAL if space for it can be afforded.—I am, etc.,

J. HENRY STORMONT.

Tamworth-in-Arden, Nov. 29th.

THE FUTURE OF THE MEDICAL PROFESSION.

SIR,—While glad to see the protest against settling terms of State military service in the absence of those serving with the forces, the ardent desire for such a service expressed by "Lieut.-Colonel R.A.M.C." (November 2nd, p. 501) leaves me very cold.

When released from my voluntary contract I shall have had four years' service as temporary Lieutenant and Captain R.A.M.C., and my most earnest hope is to be able then to resume my individuality again after being for that period snowed under by A.F.'s, A.C.I.'s, and "pleases"; and nothing but compulsion, *absit omen*, would make me accept a position in which I was not my own master and able to choose my own patients.

When I reoccupy my old house I shall have to start my practice again, not because my personal friends and colleagues who have been carrying on will not act loyally by me—I know they will to the utmost—but because they cannot return patients who are not there; in a suburban practice in ordinary times the individual families do a lot of moving out of district in four years, but when present one has a share of the newcomers. Now in four years' absence the number of patients left to be returned to one will form only what advertisement would describe as a nucleus, and one can only wait for better times.—I am, etc.,

November 22nd. TEMP. CAPT. R.A.M.C.

SIR,—In a letter in the BRITISH MEDICAL JOURNAL for November 23rd Dr. P. Macdonald said, "I profess my preference for the present personal relations, and I believe them to be best for the community." The majority of the doctors who were in practice before the Insurance Act came into force will support his views. Panel practice does not meet the ideals of doctors or of the masses of the artisan classes. The panel system has been tried and found wanting. It is now ready to be scrapped. In the army and navy the doctor is the "hireling of the State." The panel doctor is very much akin to the "hireling," and his conditions are on business lines. The work of the clerical and medical professions is, or should be, based on higher ideals. In the past the family doctor has been the trusted confidant and health pilot. A State medical service might possibly be modelled so as to be far better than the panel system if the excessive clerical work were reduced and the remuneration such as to ensure reasonable conditions for doing work, with provision for holidays and superannuation at 65. There are many panel doctors who are overworked, worried with financial difficulty, and absolutely unable to take a much-needed holiday. My experience of panel work and Poor Law work is that the latter is far preferable. The former I gave up after one year's experience. The latter I kept until I retired from general practice with superannuation.—I am, etc.,

Blackpool, Dec. 2nd. JOHN BROWN, M.D.

A.M.S. AND S.M.S.

SIR,—Not a few will feel and resent Dr. Gordon's attack on the officers of my corps (November 30th, p. 616) who had the honour and pleasure of serving before 1898. The officer whose suggestion he singles out is about an 1898 man, but, apart from that, he was purposely showing the extreme side to stimulate the interest of the profession in this important matter.

Dr. Gordon lays what he is pleased to designate as a catastrophe at the door of the regular medical service, and this is absolutely unfair. I was the second member of a board at Simla in 1910 to reorganize hospitals, which made many very radical suggestions, but all were thrown out by the finance department. If these had been carried out things would have been better. We were all aware of the necessity for reform for many years. There may have been faulty administration, and those involved have been dealt with, but it is unjust to attack the whole regular medical service.

I would venture to remind Dr. Gordon that the medical profession is the chief upholder of the virtue of charity, and the cultivation of this is never more needed than in these days. I will give this distinguished gentleman credit for appreciating that he has been unfair when he sees his letter in print, for I am confident that he is too big a man yet not to have the courage to own it.—I am, etc.,

W. A. MORRIS, Lieut.-Col. R.A.M.C.(R.P.),
Deputy Commissioner, National Service.

Cardiff, Dec. 7th.

GOOD-BYE! TAKE CARE OF YOURSELF!

SIR,—It may interest and assist other Territorial officers who mobilized in August, 1914, to have the experiences of one recently selected for early demobilization.

Having received orders to report to the War Office and so reported; having filled in various forms and been admitted to the presence, my name was looked up and information imparted: (1) That I was for immediate demobilization, and (2) would enter the T.F. Reserve next day; (3) that I was now mainly a civilian but might wear uniform at military ceremonies; (4) I was asked if I claimed to suffer any physical disability resulting from military service and to sign a form that I did not so claim; (5) I was referred to another room for a warrant to proceed to my home.

In answer to protest and subsequent questions I learned, (1) that I could not be demobilized to the active list, from which I mobilized, but would not forfeit any seniority if recalled, or if at a later date replaced on the active list by my own application. (I have not noticed a regulation to that effect among the many stripping all privileges from the R.A.M.C.T.F.) (2) That, as I had not myself applied for demobilization, the gratuity paid would be that of my permanent rank, not of the acting rank held for two years in the field and in which I was ordered to report and demobilized. (Temporary rank was recently abolished in the T.F.; permanent field rank and gratuity as such requires twelve years' service—temporary field rank, and gratuity on that rank, is obtainable for temporarily commissioned officers with any or no service; in fact, a temporarily commissioned officer, lieutenant or captain for two years and major for two, scores on gratuity over a territorial officer, major for four years.)

There was no offer of even a week's leave with pay. (I was next on my unit's leave roster, and hoping to get away about Christmas for fourteen days; twelve days' leave is being given at Christmas to as many home service men as possible.) There was no offer of part-time duty—*à la suite* or as civilian medical practitioner—to tide over the period while trying to regather the threads of a consulting practice, dropped in August, 1914.

I may add that some complaint appeared to be anticipated.—I am, etc.,

December 9th. CAPTAIN R.A.M.C.(T.F.R.).

MEDICAL ADVISERS OF INDIAN GOVERNMENTS.

SIR,—In a report which appeared in your issue of July 6th regarding a deputation from the British Medical Association which waited on the Secretary of State on June 27th, Surgeon-General Benson, once Surgeon-General with the Government of Madras, is reported to have said that the Surgeon-General has no access to the members of council or to the Governor. This statement is quoted in your editorial comment.

In order to show how far Surgeon-General Benson's statement corresponds with facts, will you allow me to say that His Excellency Lord Pentland, who for the last six years has been Governor of Madras, has made it a regular practice to see the Surgeon-General on one fixed day every week, while both the past Surgeon General (Major-General Bannerman, C.S.I.) and the present Surgeon-General (Major-General Giffard, C.S.I.) have had interviews with the member of council in charge of the portfolio of medicine whenever they wished and with no more notice than is involved in a previous call on the telephone to make sure that he is not absent?—I am, etc.,

Madras, Oct. 10th. A. G. C.

⁂ We have referred this letter to Surgeon-General Benson, who expresses his pleasure at learning that Lord Pentland has made it a regular practice to see the Surgeon-General weekly. This practice did not obtain during his tenure of office as Surgeon-General of Madras. We, however, must reiterate the opinion that the Surgeon-General should have access to the Governor as a matter of right, independently of the personal view held by the Governor of the day. The British Medical Association pointed out in its memorandum that the Surgeon-General in each province should be a secretary of the Government in the medical and sanitary department, so that his recommendations, and the reasons on which they are based, shall reach the executive of the province directly and not secondhand. The antiquated method under which the

head of the health service of a province has to make his recommendations and explain the grounds for them through a lay member of Council should be abolished.

THE SCOTTISH UNIVERSITY CONSTITUENCY.

SIR,—The address of Dr. Peter Macdonald, M.A., is before me, an elector of the Scottish universities. He is out for the reconstruction of medicine—apparently rather an unfortunate phrase, for I judge he really means a re-casting of the method of work of the medical profession as individual medical practitioners. He would have us all become so-called specialists—that much-abused term both by the profession and the general public. A young man, after qualifying, frequently specializes on this or on that, and becomes a most unfortunate individual, not able to see his patient in any way save through his own pet instrument—the skin lens, the ophthalmoscope, the otoscope, and so on. The rest of the body can go hang as far as concerns this enthusiast, and with what result? The unfortunate victim has his ideas focussed on one part of his body only to the neglect of the rest, and until he gets into the hands of a general practitioner of wide experience and general erudition he will never recover.

As to Dr. Macdonald's other points, they are those of the Labour party. This body, I understand, binds its parliamentary nominees strictly down to its programme, which at the present time aims at the destruction of existing social methods of our daily life; their reconstruction by Labour methods will tie the British working man and woman hand and foot—everything ordered by a bureaucracy and paid for by their wages, for the so-called wealthy classes have not the cash to do it with.

Many Scottish, including sons of the manse, have had brilliant scholastic careers, and have in later years justified their bright young manhood; others, unfortunately in narrow groove, do not grasp the high ideals of life. I expect the Scottish universities will return as their members men of mature judgement, scholarship, and general erudition befitting these ancient seats of learning. —I am, etc.,

ALLAN E. L. GRAY, M.B., C.M.Edin.

Darlington, Dec. 9th.

SIR,—We understand that the supporters of Professor W. R. Smith's candidature for the Scottish universities are stating that Professor Smith was adopted by this Committee as a suitable representative for the constituency.

This is an erroneous reading of the action of the Committee, which has adopted no candidate for any particular constituency.

A list has been made of medical candidates for the election now upon us, and these medical men have been approved for Parliament by the Committee, in discharge of the responsibility laid upon it by the general meeting of the medical profession at which the Committee was formed.—We are, etc.,

ARTHUR LATHAM,
CHAS. BUTTAR,
Hon. Secretaries.

Medical Parliamentary Committee,
20, Hanover Square, London, W.1,
December 10th.

THE LONDON UNIVERSITY ELECTION:

A PROTEST.

SIR,—I find that Sir R. Douglas Powell, Dr. Sidney Phillips, and Mr. Eccles have circulated a postcard on which they state that "the chance of returning a medical candidate, who is not a graduate of our university, is very remote." As I am the only medical candidate, the statement is that my chance is very remote.

That is not political manners. You may say of your opponent that he will ruin the country or that he has ruined his grandmother. But, as regards the election itself, you treat him with courtesy and suppose that you meet on equal terms. You do not adopt the boastful manners of Homeric heroes or Goliath of Gath before the fight begins. From that point of view it is an impertinence. From another it comes very near to being a lie, for they state as a fact what they cannot possibly know to be true, and the statement is, so far as I know, quite unwarranted. I am not relying on medical votes alone. All of us, I suppose, draw our support—at least I know I do—from all faculties. The medical vote alone is not large enough to return a candidate, but if I get a fair share of it I shall, as far as I can see, stand a very good chance. At any rate, I am quite sure they do not know the contrary, and they have no business to state it as if they did. Four days ago I was told by an elector—and an experienced elector, too—that Sir Philip Magnus would be at the bottom of the poll; and, upon my word, when I see his committee reduced to such tricks I begin to believe that they think so too. The statement has just as much foundation as their own. The truth is that in a constituency like this no one knows what any one else's chances are. He only knows the cards he holds himself. If there is not a medical member for the university it will be due chiefly to these three medical men.

And why in the world should they single me out for an attack of this kind, who am of their own profession and a colleague? Why do they not say that Mr. Somerville's or Mr. Nordon's chances are very remote? They know just as little about theirs as they do about mine, and have just as much ground for the statement. But they have no right to say it of any one, and they ought to be ashamed of themselves. That is what comes of party.—I am, etc.,

London, W., Dec. 9th. W. P. HERRINGHAM.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE time is approaching, in the opinion of the Committee of Management of this Fund, when a decision will have to be made as to the future. The money in hand is nearly exhausted, and the war is over, but there is still need for help; and what part, if any, the Fund can still play in meeting these needs must soon be determined.

Sir Rickman Godlee, the Chairman of the Committee, has received a letter from Dr. V. Pechère, the President of the Comité National de Secours et d'Alimentation, representing the Aide et Protection aux Médecins et Pharmaciens Belges Sinistrés; this is the representative Belgian Committee, sitting in Brussels, to which the mensualities of the Belgian Doctors' and Pharmacists' Relief Fund have been transmitted for distribution, while the minutes of this Belgian body have been summarized frequently in our columns and those of our contemporaries, to show alike the receipt of our contributions and the manner of their allocation. Dr. Pechère promises to send a complete report of the combined work of the Committee in this country and in Belgium. In his letter he expresses on behalf of himself and his colleagues, both doctors and pharmacists, in the warmest terms their appreciation of the assistance given through the Belgian Doctors' and Pharmacists' Relief Fund. They know, he says, and will never forget, what they owe to their British brethren and to all those who by their generosity have contributed to mitigate the calamities which imposed so much suffering on Belgium.

SUBSCRIPTIONS TO THE SECOND APPEAL.

The following subscriptions have been received up to Monday last, December 9th:

	£	s.	d.
Dr. H. O. Williams ...	2	2	0
Mr. S. Osborn	1	1	0
Dr. C. C. S. Watson ...	5	0	0
Woolwich and Lewisham Division B.M.A. (per Dr. C. J. Fuller, hon. sec.)	7	0	0
Sir Alfred Pearce Gould (monthly)	5	0	0
Ross and Cromarty Division B.M.A. (per Dr. E. Mackenzie, honorary secretary)	8	17	6
Mr E. Boulanger	7	15	8
Royal Faculty of Physicians and Surgeons of Glasgow	26	5	0

Monthly Subscriptions.

The following monthly subscriptions have been received for November:

	£	s.	d.
Dr. Vincent Tighe ...	0	10	0
Dr. G. Grey Turner ...	1	1	0
Dr. W. E. Good	0	10	0
Dr. W. Luffman	0	10	0
Dr. A. E. Naish	0	10	0
Dr. J. O. Musson	0	10	0
Dr. T. W. Goodbody ...	1	0	0
Sir T. Barlow	0	10	0
Surg. P. G. S. Davis, R.N.	0	10	0
Dr. A. B. Stevens	1	0	0
Major E. R. Fothergill ...	0	10	0
Dr. W. S. Hart	1	0	0
Dr. A. Graham	1	1	0
Dr. Hyla Greves	0	10	0
Dr. H. Caiger	0	10	6
Dr. K. J. Dougall	0	10	0
Dr. A. W. Forrest ...	1	0	0
Captain H. L. P. Hulbert, R.A.M.C.	1	0	0
Dr. E. C. Morland ...	0	10	6
Dr. H. Whitehouse ...	0	10	0
Dr. A. Hawkyard	0	10	0
Dr. W. Stewart	0	10	0

Subscriptions to the Fund should be sent to the treasurer, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W.1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

Obituary.

ALFRED ELLINGTON STANSFELD, M.A., M.D.CANTAB., F.R.C.P.LOND.,

Physician to the Metropolitan Hospital, and Demonstrator of Pathology, St. Bartholomew's Hospital.

WE have to record with great regret the death at the early age of 35, of Dr. Alfred Ellington Stansfeld, which took place on November 25th from pneumonia following influenza. Entering St. John's College, Cambridge, with a major scholarship in 1902, he gained first class honours in both parts of the natural sciences tripos, and graduated B.C. in 1909, proceeding to the M.D. degree in 1915. At St. Bartholomew's Hospital his career was exceptionally brilliant. He won there an entrance scholarship, the Kirkes scholarship and gold medal, the Burrows prize, the Brackenbury medical scholarship, and the Lawrence scholarship and gold medal. After holding the post of house-physician he was appointed casualty physician, and assistant demonstrator of pathology in the medical school; and at the date of his untimely death he was senior demonstrator of pathology at St. Bartholomew's, and physician to the Metropolitan Hospital. He also carried out the pathological work of the venereal disease centre for pregnant women at Thavies Inn, which has been referred to on several occasions in these columns. In 1911 he obtained the membership of the Royal College of Physicians and was elected to the Fellowship this year.

Stansfeld's death almost at the outset of a distinguished professional career is a great loss to St. Bartholomew's Hospital, where his high attainments and his loyalty and devotion to duty were fully appreciated by colleagues and students alike. In him was recognized that rare combination of clinical taste and aptitude, scientific ability, and skill in teaching, which marks a man down for the highest honours in our profession.

The following words which we quote from the current number of *St. Bartholomew's Hospital Journal* convey something of the sense of loss felt by those who knew and worked with him: "In his day one of our most brilliant and popular students, his later work had more than fulfilled the promise of his earlier years. The tremendous amount of work always so willingly undertaken by him in this and other hospitals had brought him a reputation unique for a man of his years. There can be little doubt, indeed, that the result of overwork lessened his chances of recovery. The hospital, and indeed the medical profession as a whole, has lost one of its most promising members."

DR. FREDERICK LUMSDEN MACKENZIE died very suddenly at Lockwood, Huddersfield, on November 24th, aged 62. Six years ago he had a serious illness due to overwork, and he never recovered his normal state of health. He was educated at the Madras College, St. Andrew's, and graduated at Edinburgh University, taking the M.B. and C.M. degrees in 1885, and the M.D. in 1898. Dr. Mackenzie was a man of gracious personality, always courteous, and full of kindly feeling. His patients loved him as a friend—their troubles he took upon himself, and nothing was too much to do if he could help them. He avoided all inducements to enter into public life, for his happiness lay in his own work, and the opportunities it offered for service. He was a keen golfer, and when captain of the Fisby Golf Club, Huddersfield, in 1893, was largely the means of founding the Yorkshire Union of Golf Clubs, of which he was the first president. He was laid to rest at Woodfield Cemetery with every evidence of affectionate regard, many of the Huddersfield doctors and other friends being present. He leaves a widow and two sons—the elder, Captain Melville Douglas Mackenzie, R.A.M.C., now serving at Bazra; the younger, Captain Kenneth Mackenzie, M.C., in France.

DR. THOMAS RICHARD BEALE-BROWNE, who was drowned at sea on October 3rd, was educated at Dean Close School, Cheltenham, and Guy's Hospital, and obtained the M.R.C.S. and L.R.C.P. diplomas in 1901. He was always keen on sports and distinguished himself in rifle shooting both at home and in Nigeria. After a few years spent in lunacy work he entered the West African Medical Service, and on his first tour, 1907–8, accompanied the Anglo-German Boundary Commission, and afterwards did good work as medical officer in various districts of West Africa. He was greatly interested in microscopical work, and while stationed at Yaba, near Lagos, made some most helpful investigations along with his friend Dr. Connal, Director of the Research Institute. His chief work in Yaba was in connexion with leprosy, when, after months of special treatment, he had the satisfaction of noting improvement in several cases and in one an apparent cure, which lasted for at least two years, but, unfortunately, this patient was lost sight of after that time. Since January, 1917, he was stationed at Victoria in the Cameroons, and after a prolonged and strenuous tour was on his way home for leave. When within a few hours of the English coast his boat, the ss. *Burutu*, owing to storm and the war conditions of no lights under which they were sailing, collided with the ss. *City of Calcutta*, and he, with many other passengers, was drowned. One of his colleagues writes: "Dr. Beale-Browne was so genuine and straightforward that he at once commanded respect from all who came in contact with him." He had in a marked degree the confidence of the native population and was popular with all Europeans who knew him. He was in his 41st year and is survived by his widow.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

THE Raymond Horton-Smith prize for the best M.D. thesis presented during the academical year has been awarded to H. Hartridge, M.D., and H. F. Marris, M.D., who are declared equal.

The following medical degrees have been conferred:

M.B., B.CH.—A. R. Hargreaves, J. D. Jones.

UNIVERSITY OF LONDON.

THE Senate has called the attention of the Controller-General of the Civil Department of Demobilization to the necessity for releasing at the earliest possible date students whose university studies had been either interrupted or prevented by service in H.M. Forces.

Sir David Ferrier, M.D., F.R.S., has been appointed chairman of the Physiological Laboratory Committee, and Professor G. A. Buckmaster, M.D., Chairman of the Brown Animal Sanatory Institution Committee.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

AT a meeting of the Royal College of Physicians of Edinburgh on December 5th Sir Robert Philip was elected President of the College, and the following Fellows were appointed to form, along with the President, the Council of the College for the ensuing year: Dr. A. H. Freeland Barbour (Vice-President), Dr. T. J. Thyne, Dr. Francis D. Boyd, Dr. G. M. Robertson, Dr. Harry Rainy, Dr. J. Lorrain Smith.

Medical News.

THE inaugural address of the Listerian Society of King's College Hospital was given on Wednesday by Sir StClair Thomson, who described the advent of Lord Lister to King's College Hospital in 1877.

THE house of the Royal Society of Medicine (1, Wimpole Street) will be closed from Monday, December 23rd, to Saturday, December 28th, inclusive. The library, however, will be open to military medical officers except on December 25th and 26th.

A WARNING poster with regard to Christmas entertainments in hospitals, camps, billets, and private houses, has been issued by the British Fire Prevention Committee (8, Waterloo Place, Pall Mall, S.W.1) and copies will be supplied on receipt of the necessary postage.

A SCHEME for the creation of clinical professorships of tuberculosis in the medical faculties of France is now before the Chamber. It has the support of a large number of deputies. In addition to clinical teaching, instruction will be given in the working of the laws relating to tuberculosis and of the institutions of social hygiene.

AT the fifty-sixth annual meeting of the Royal Surgical Aid Society, held at the Mansion House on December 9th, it was reported that during the past year 30,000 surgical appliances had been supplied, and that since its foundation in 1862 the society had assisted 649,183 patients and supplied 995,000 appliances. The Lord Mayor was elected a vice-president.

DR. JAMIESON HURRY has presented to the Art Gallery, Reading, another historical picture. It is painted by Mr. Harry Morley, A.R.C.A., and represents the "Trial by Combat" of Henry of Essex and Robert of Montfort, which took place at Reading Abbey in 1163. The combat is mentioned by Carlyle in his *Past and Present*. The picture has been given as a thankoffering for armistice day, November 11th, 1918.

AT a meeting of the Académie des Sciences, Paris, on November 11th, Marshal Foch was unanimously elected a member in the room of the distinguished surgeon, M. Léon Labbé. On December 3rd M. Clemenceau was elected by acclamation a member of the Académie de Médecine. He was begged to accept the seat in order that the Academy might have the advantage of his great experience in framing a scheme of social hygiene.

THE first Indian Science Congress founded on the lines of the British Association was held at Calcutta in January, 1914; it held its second meeting at Madras in 1915, under the presidency of Surgeon-General Bannerman. The third congress was held at Lucknow (1916), the fourth at Bangalore (1917), and the fifth at Lahore (1918). The sixth meeting is to take place in Bombay early next month under the presidency of Sir Leonard Rogers, F.R.S., I.M.S. Lord Willingdon is patron of the congress, and Sir Dorab Tata chairman of the local committee.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

The postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

QUERIES AND ANSWERS.

PROLONGED GESTATION.

C. B. G. states that the husband of a primipara left his wife for the army on January 5th. Her baby was born fifty days after the 280 days usually assigned for the period of gestation. It weighed 8 lb. The labour was a very severe instrumental one, owing to the hardness and roundness of the baby's head.

*** According to a statement in Mann and Brend's *Forensic Medicine* (1914) the longest gestation yet allowed in an English law court was 301 days, but in America a period of 317 days has been allowed. In Dr. F. J. Smith's edition of Taylor's *Medical Jurisprudence* it is stated that Murphy has allowed 324 days and that Meigs considers that gestation might be continued for twelve months. Dr. Thurstan Holland read a note at the meeting of the Liverpool Medical Institution on February 27th, 1902 (BRITISH MEDICAL JOURNAL, March 15th, 1902, p. 659), on the duration of pregnancy based on the case of a young primipara; dating from the last date of normal menstruation to the birth of the child, the duration was 340 days; from the date of the last coitus to the birth was 323 days; from the date of the menstruation following the coitus (an abnormal period only lasting two days) the duration was 316 days.

INCOME TAX.

C. D. S. has been acting as medical officer in charge of troops stationed in his neighbourhood, receiving payment at the rate of £1 a day. Is the full "earned" rate of income tax payable?

*** From the particulars furnished we understand that our correspondent is not in the army and is probably not amenable to full military discipline, consequently he falls within the category of a temporary civilian employee and is not entitled to the special "service" rate of income tax and is assessable at the "earned" rate.

LETTERS, NOTES, ETC.

THE ORGANIZATION OF AMBULANCE WORK.

THE EARL OF RANFURLY (Director of the Ambulance Department of the St. John Ambulance Association) writes: I was very glad to see in your issue of December 7th a letter from Sir James Cantlie, a Knight of Grace of the Order of St. John, referring to the organization of ambulance work. As Sir James points out, the first Voluntary Aid Detachment formed in London was about the year 1908, and it will be interesting to those of your readers who may be ignorant of the fact to know that the St. John Ambulance Brigade is the pioneer of voluntary ambulance work. This work has been one of the most important duties of the Order of St. John under its Charter since 1877, being carried out by the St. John Ambulance Association so far as teaching is concerned, and by the St. John Ambulance Brigade in keeping up and putting to practical effect the knowledge so gained. So long ago as 1878 there was in existence a body of workers, formed by one of the centres of the St. John Ambulance Association, and consisting of duly qualified first-aiders. This might also be called the first Voluntary Aid Detachment; at any rate, it was the origin of the St. John Ambulance Brigade, of which the membership is now over 66,000, and which maintains the Royal Naval Auxiliary Sick Berth Reserve and Military Home Hospitals Reserve, and which, during the South African war, supplied the R.A.M.C. with 2,000 fully trained men, and during the present war supplied the naval and military authorities with over 22,000. The St. John Ambulance Association and Brigade have now established centres and divisions not only at home but also throughout almost the whole world.

DR. JOHN WISHART (Newcastle-upon-Tyne) writes: The paragraph in your issue of December 7th (p. 644) contains a small error in claiming that the London College of Ambulance is "the only school of the kind in the kingdom." The Newcastle and Northumberland College of Ambulance was organized on October 1st, 1912, and became the North of England College of Nursing and Ambulance on January 1st, 1914. It was established in order to put ambulance and nursing work on a higher plane, and has conducted, in addition to the ordinary courses, a course of training in midwifery.

BACTERIAL DIAGNOSIS OF DIPHTHERIA.

LIEUT.-COLONEL J. S. WARRACK (London) writes: With reference to Dr. A. Lyster's letter on the bacterial diagnosis of diphtheria and his comments on my article on differential diagnosis in your issue of November 23rd, I would reply that I was dealing with diphtheria as a mixed infection and not with morbid conditions of the throat generally. Does Dr. Lyster seriously suggest that swabs are to be taken from the throats of all cases of scarlet fever and measles?

CALOMEL IN PRURITUS ANI.

A FEW months ago that admirable weekly *Ugeskrift*, the journal of the Danish Medical Association, contained a short note on the remarkable effect of calomel on even old-standing obstinate cases of pruritus ani. The note evoked a chorus of approval from other writers whose contributions on this subject to later numbers of *Ugeskrift* have often been illumined by the whimsical wit of the Dane. Some of these writers could claim many years' experience of calomel in pruritus, and others expressed the enthusiasm of the newly converted. One writer drew a picture of the local magnate and profiteer, scorning the local practitioner, journeying to some famous German spa to rid himself of his anal itch and returning unrelieved, while his poor and humble compatriot stayed at home and was cured in a trice of the same ailment by a doctor drawing his inspiration from *Ugeskrift*. The only discordant note was as to whether calomel should be used in powder or in an ointment. Dusted on as a powder, calomel, it is stated, will stick like a white lacquer for twenty-four hours. Applied as an ointment it is apt to soil the linen and to be less effective.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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An average line contains six words.

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NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.